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Center for Health Services Research and Development
AMERICAN MEDICAL ASSOCIATION

Profile of Medical Practice 1981

David L. Goldfarb
Editor

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may be purchased from:
Order Department OP 325
American Medical Association
P.O. Box 821
Monroe, WI 53566

ISBN: 0-89970-097-7
ISSN: 0194-2921

LAB: 80-1328: 3.5m: 6/81

Dedication

This Tenth edition of Profile of Medical Practice is dedicated to the memory of Edward F. Meeker, Ph.D. (1943-1980), formerly Director, Department of Economic Research, Center for Health Services Research and Development, American Medical Association. During his years at the AMA, "Ted" made many valuable contributions to health services research, not the least of which was his leadership in the development of the Profile series. His last research project is the lead article in this volume. His insight, sensitivity, and humor are missed by those who knew him.

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Foreword

Profile of Medical Practice is a valuable reference guide to readers interested in health care issues. *Profile* contains current data describing physicians' medical practices in the United States, and articles analyzing the social, economic, and policy issues relevant to health care.

The tenth annual edition of *Profile* focuses on trends and changes observed in the health care system during the past decade. Statistics in this volume are derived principally from the AMA Center for Health Services Research and Development's *Fourteenth Periodic Survey of Physicians* (PSP). Data from this ongoing survey facilitate comparisons, over time, of key medical practice characteristics. Extensive efforts are made to ensure the accuracy and reliability of statistics tabulated in this volume.

This year, the selection of articles in *Profile* attempts to provide a varied survey of important issues and changes relevant to the health care sector in the 1980s. The opening article, "Competitive Forces in the Market for Physicians' Services: A Survey of Current Research," focuses on the issue of competition versus regulation in the physicians' services market. The article reviews three relevant topics in this debate: the impact of insurance on patient and provider incentives; the supplier-induced demand and target-income controversies; and the pros and cons of fee-for-service reimbursement. The other articles in this volume examine the issue of regulation in the health care sector as well as an array of specific topics and trends in the economics of physicians' services.

Profile includes contributions from researchers within the AMA Center for Health Services Research and Development and from individuals in the broader health services research community. These papers are offered to provide readers with a variety of perspectives and do not necessarily reflect AMA policy.

We at the Center believe that this edition of *Profile* will prove useful to all readers interested in the United States health care system.

Lynn E. Jensen, Director
Center for Health Services
Research and Development
American Medical Association

Acknowledgements

The editor wishes to express sincere appreciation to the following persons for their help in the preparation of this volume: Frederic D. Wolinsky for supervising construction of the data file with the assistance of Barbara Corry; Pat Kelps and Virgie Vi[illegible]ara for typing the manuscript; Arsenio Oloroso for coordinating the production of the volume; and Anita L. King for her assistance in preparing the manuscript. The editor also wishes to thank John Gaffney, Jack Werner, and Lynn E. Jensen for their helpful comments and advice. A special note of thanks is extended to Susan Crawford, Director, AMA Division of Library and Archival Services, and Mary Devlin, Director, Department of Special Collections, for their efforts in compiling the index to this volume.

Note to Prospective Authors

Profile of Medical Practice publishes research papers relating to the economics of medical practice. Authors who wish to submit an article to be considered for inclusion in the eleventh edition of Profile of Medical Practice should send a brief abstract no later than October 1, 1981 to:

Editor
Profile of Medical Practice
Department of Economic Research
Center for Health Services Research
and Development
American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

The editor will respond to the abstract by sending a copy of the style manual. Three (3) complete copies of the paper must be sent to the above address by December 31, 1981.

Manuscripts will be submitted to referees and the author will be informed of their decision shortly after receipt of the paper.

Part I—Competition Versus Regulation in the Health Care Market

The election of President Reagan in November appears to have dramatically altered federal attitudes toward the health care sector. In contrast to the Carter Administration, which focused its attention on cost containment and regulation of health care services, serious proposals to adopt a pro-competitive initiative are presently being given serious consideration. In anticipation of the forthcoming policy debate over this stance, this volume presents three papers which analyze the issue of competition versus regulation in the health care sector.

In "Competitive Forces in the Market for Physicians' Services: A Survey of Current Research," John Gaffney et al. attempt, through an analysis of current research, to evaluate whether market forces are operative in the physicians' services market. In this review, research is surveyed in three important topics of the debate: the impact of health insurance on patient and provider incentives; the supplier-induced demand and target-income controversies; and the pros and cons of fee-for-service reimbursement of physicians versus alternatives such as salary and percentage arrangements.

"Health Regulation: Some Ideas on How to Improve It," by J. G. Atkinson argues the inevitability of regulation in the health care sector and proposes ways to induce market-like incentives in the regulatory process. In support of his views, the author describes two case histories. One case history shows the adverse consequences that result from a regulation without appropriate incentives and penalties to encourage movement by the regulatee toward desired goals; the other case history embodies within it these incentives and penalties.

The third paper, "Prospects for Regulation of the Health Care Sector in the 1980s," by Roger Reynolds presents a regulatory prognosis for the health care sector. The theory of regulation is reviewed to provide a basis for analysis and predictions. Based upon the continued resistance toward further tax increases and the mounting fiscal restraints on state governments brought on by rising costs for purchased medical services, the author argues that governments are likely to continue to expand health care regulations. In the postscript, the author predicts that the proposed federal caps on Medicaid expenditures are likely to spread to the Medicare program.

Competitive Forces in the Market for Physicians' Services: A Survey of Current Research *by John C. Gaffney, Philip G. Cotterill, and Edward F. Meeker**

Explanations of why health care costs in general and physicians' fees in particular, have risen faster than other prices in the economy frequently emphasize that the physicians' services market is fundamentally different from other markets (Davis 1975, 1978; Dyckman 1978; Evans 1974). The economic uniqueness of the physicians' services market is usually attributed to widespread insurance coverage, which makes patients and providers insensitive to cost (Pauly 1968; Feldstein 1973) and to limited patient information about medical matters, which results in the delegation of utilization decisions to the physician (Arrow 1963; Pauly 1978).

Some researchers have argued that these factors make impossible the effective operation of market forces and enable physicians to increase their fees and expand the services they provide with few constraints from the laws of supply and demand (Dyckman 1978; Evans 1974).[1] The logical policy implication of this reasoning is that increased reliance on governmental regulation is necessary to improve the allocative efficiency of the physicians' services market (Davis 1975, 1978; Evans 1974; Gabel and Redisch 1979). Other health services researchers and policymakers believe that the market can be improved and strengthened to achieve simultaneously the equity and risk-sharing benefits of insurance and the allocative efficiency benefits of a competitive market (Enthoven 1978a, 1978b, 1978c; National Commission on the Cost of Medical Care, Vol. 1, 1978). This policy debate turns on the basic question: Is an "effective market" for physicians' services viable? That is, do market forces represent an effective constraint on both provider and consumer decisions in the market for physicians' services?

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*John C. Gaffney, Ph.D., is Research Associate, Center for Health Services Research and Development, American Medical Association. Philip G. Cotterill, Ph.D., is Economist, Office of Research, Demonstrations and Statistics, Health Care Financing Administration. Edward F. Meeker, Ph.D., (deceased) was Director, Department of Economic Research, Center for Health Services Research and Development American Medical Association. Work on this project was completed while all three authors were on the staff of the AMA's Center for Health Services Research and Development. The views expressed in this paper are those of the authors and do not necessarily represent the official policy or position of the American Medical Association or the Health Care Financing Administration. The authors would like to thank Fredric D. Wolinsky for comments made on an earlier draft of this paper.

[1] These arguments go beyond the assertion that the physicians' services market is not competitive and that physicians, either individually or collectively, possess market power. Few markets are perfectly competitive, and the presence of some market power is not unique to the physicians' services market. Since this review focuses on the factors which are unique to the physicians' services market, research which investigates conventional market power is largely excluded. For a review of research on conventional market power in the physicians' services market, see Sloan and Feldman (1978) and Sloan (1979).

This paper summarizes research on several topics which bear directly on this question. The opening section examines the impact of insurance on patient and physician incentives with special attention on the effects of alternative arrangements used by third parties to reimburse physicians. The next section discusses the effect of limited consumer information on the functioning of the market in the context of the literature on physician-induced demand and target-income models of physician behavior. This section concludes with an analysis of the physician-patient agency relationship, especially as it relates to surgical utilization. Some analysts who believe that physicians abuse the agency relationship argue that the problem stems from the incentives inherent in the fee-for-service reimbursement system. The final section reviews existing research which has attempted to compare and contrast the performance of fee-for-service practice with that of health maintenance organizations.

THE IMPACT OF INSURANCE ON PATIENT AND PHYSICIAN INCENTIVES

The potential for insurance to erode the proper functioning of the market can be traced to several sources. Because health insurance reduces out-of-pocket expenditures on physicians' services, it reduces the apparent "cost" to the patient. Since insured individuals demand more care than they would if they were uninsured, insurance tends to raise the price of medical care, as long as unit costs increase with output. (Pauly 1968; Feldstein 1973). This demand-increasing phenomenon is called the "subsidy" effects of health insurance. However, the impact of insurance on medical care prices, and its consequences for the functioning of the market depend critically upon the specific nature of the insurance (Frech and Ginsburg 1975). Current research has analyzed the incentives facing both consumers and physicians under alternative insurance arrangements.

Insurance and Consumer Behavior

Frech and Ginsburg (1975, 1978) emphasize that some out-of-pocket costs to consumers are necessary if the market is to function at all. If the effective price to the patient is zero, neither consumer nor physician has any incentive to restrain costs, and explosive price increases may result. Deductibles and coinsurance are the primary methods of creating out-of-pocket costs to consumers under existing insurance arrangements. Of course, out-of-pocket costs are also generated by a lack of insurance coverage or limitations on the extent of coverage.

The incentive to search for lower cost sources of medical care is greatest when no insurance exists and is absent when coverage will pay the entire bill. In analyzing the incentive effects of alternative types of health insurance, economists commonly have distinguished between policies which provide indemnity benefits and major medical policies with coinsurance. Indemnity benefits pay a fixed dollar amount of the bill, and the patient must pay any difference between the bill and the amount paid by the insurer. Under major medical policies with coinsurance, the patient pays a predetermined fraction of the bill.[2]

With indemnity benefits, for every dollar of expense which exceeds the allowed indemnity payment, the patient's marginal out-of-pocket cost is one dollar. On the other hand, with major medical insurance, the marginal out-of-pocket cost is less than one dollar, depending on the coinsurance rate (the fraction of each additional dollar of the bill paid by the patient). The patient's incentive to search for less expensive providers is greater in the case of indemnity benefits than with major medical coverage (Frech and Ginsburg 1975). In turn, the incentive to search increases as the coinsurance rate increases. Therefore, in the presence of insurance, market forces will be more effective the more prevalent are indenmity benefits and/or the higher are coinsurance rates (French and Ginsburg 1975; Sloan and Steinwald 1975).

Insurance and Physician Behavior

The presence of insurance also complicates the market for physicians' services by creating an intermediary role for the insurer as the reimbursing agent of the physician. In turn, the physician's responsiveness to market forces depends, in part, upon the economic incentives created by the insurer's reimbursement structure. Within the fee-for-service system, insurers' choices among reimbursement alternatives range from paying the full amount of the physician's bill to paying a specific amount set by a fixed fee schedule.[3] The "usual, customary, and reasonable" (UCR) method pays the full amount of the physician's bill within certain limits established by comparisons with both past fees of the individual physician and with the fees of physicians within the community. Sloan and Steinwald (1975) provide the following capsule description of the UCR method of setting fee schedules:

> Under UCR, historical profiles of fees are established for individual physicians (usual fees) and for similar physicians in a community (customary fees). A claim for a covered service will be reimbursed in full if 1) the fee does not exceed the physician's typical (presumably, modal) charge for the procedure; and 2) if the fee is less than or equal to

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[2] Major medical policies may include deductibles. While expenditures made prior to exceeding the deductible are, in a sense, uninsured, consumers may behave as though such expenditures were insured if they expect to exceed the deductible during the allotted time period. (See Keeler, et al., 1977a and 1977b).

[3] Depending upon the coinsurance provisions of a particular policy, the consumer may pay some part of the physician's bill whatever reimbursement method the insurer uses.

a fee corresponding to a specified percentile level in the community's frequency distribution of physicians' fees for the procedure.

This method is used by many Blue Shield and commercial plans and by the Federal Government in the Medicare program. However, terminology and detailed administration of UCR vary widely. In many cases, physicians who "participate" in a Blue Shield plan (accept "assignment" under Medicare) agree to accept reimbursement determined under UCR as full payment for the service provided. In other cases, the physician is permitted to bill the patient for any excess between his full charge and the UCR reimbursement amount ("balance billing"). The extent to which physicians are allowed to engage in balance billing has become an important policy issue at both the federal and state levels. (See testimony of Frank Sloan, John Holahan, and others in Hearing on Rate Filing of Blue Shield, Commonwealth of Massachusetts, Department of Banking and Insurance, Division of Insurance, November-December 1978.)

McNerney (1978) argues that the evolution of UCR reimbursement is best seen in the context of Blue Shield service benefit plans—plans which place fundamental importance on physician participation agreements. He states that, originally, participating physicians were paid according to predetermined rates, with some consumer cost sharing. First-dollar coverage was limited to lower income customers (Sloan 1977). During the 1960s, some Blue Shield plans began to offer benefit packages with first-dollar coverage and no income limits. McNerney (1978) claims, "UCR is a technical response to the market demand for full payment programs without income limits, which require reorganization of the varying costs of doing business by medical specialty and by geographic location." That is, UCR evolved, in part, because of the difficulty of developing fee schedules which would allow Blue Shield plans to satisfy both their customers (by providing first-dollar, service benefit coverage) and their participating physicians (by providing reimbursement levels equal to "usual" and/or "customary" fees), while simultaneously imposing some form of upper limit on reimbursement levels.

Several health services researchers, including Dyckman (1978), Frech and Ginsburg (1975), Holahan, et al. (1979), and Sloan and Steinwald (1975) argue that UCR is potentially more likely to lead to rising physicians' fees than are fixed-fee schedules. Sloan and Steinwald (1975) state that the inflationary impact of UCR will be greater 1) the more frequently the physician is allowed to update his usual charge; 2) the higher the percentile cutoff in the community fee distribution used in determining the customary charge; and 3) the more current the time period of the community fee distribution used in determining the customary charge. Because these decisions are in the hands of the insurer, it is an empirical question to determine whether or not UCR has resulted in more rapid rates of fee inflation than fixed-fee schedules.

From the individual physician's perspective, UCR has inflationary incentives. By charging higher fees now, the physician can raise the level of his reimbursement in the future, since higher fees this year will raise his future usual charge and, to a lesser extent, the customary charge.[4] (See Frech and Ginsburg 1975 and Holahan, et al. 1979.) There are ways, however, of offsetting this effect. For example, in the early 1970s Medicare lowered the percentile used in calculating the customary (Medicare prevailing) charge from the 82nd to the 75th percentile. Increases in Medicare prevailing charges are now limited, where binding, by increases in the Economic Index. The Economic Index, instituted in 1976, is a composite cost index whose components attempt to measure the costs physicians face in providing medical care services. If existing trends persist and the Economic Index continues to increase less rapidly than physicians' fees in general, all Medicare charges will gradually converge upon the customary (Medicare prevailing) charge (Holahan, et al. 1979). As a result, the Economic Index will convert the Medicare reimbursement system from UCR to a set of fixed-fee schedules.

From Sloan and Steinwald's (1975) discussion of fixed-fee schedules, it is clear that UCR and fixed-fee schedules share similar disadvantages. Under both methods, physicians have incentives to order those procedures which are reimbursed relatively generously. Both methods reimburse procedure by procedure and hence provide incentives for a la carte billing. However, because UCR allows interphysician differences in reimbursement, it can account to a greater degree than a fixed-fee schedule for variations in resources used for the same procedure under different circumstances. As a result, the incentive for a la carte billing and for increasing the number of patient encounters should be less under UCR than under fixed-fee schedules. Fixed-fee schedules provide an incentive for the physician to perform more procedures, each with a minimum amount of resources. Total third-party reimbursement may be greater if the physician performs a given set of tasks in a greater number of patient encounters than if all the tasks are performed in a single visit.

Efforts to offset the inflationary impact of UCR by moving towards fixed-fee schedules raise another set of problems. For example, Holahan, et al. (1979) have shown that physicians' supply of Medicare and Medicaid services is sensitive to Medicare and Medicaid reimbursement rates. Hence, efforts to use fixed-fee schedules to constrain Medicare and Medicaid reimbursement levels below other rates would result in reduced access to care for Medicare and Medicaid beneficiaries. There is some evidence that this effect has already occurred (Holahan, et al. 1979). The fact that the physicians' services market consists of an uninsured segment and an insured segment with many third-party payors, both private and public,

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[4] If higher fees are associated with higher out-of-pocket costs for patients, reduced demand may constrain fee increases of this type.

complicates efforts to change reimbursement practices in a single segment of the market. It is almost impossible to avoid differential effects on quality and access.

Dissatisfaction also has been expressed with the relative fee structure generated under UCR (Sloan 1979). One criticism is that UCR permits too much fee variation among individual physicians and geographical areas and leads to fees which are not competitively determined. Variation in fees and the alleged absence of competition are both cited as evidence that the relative fee structure should be altered. Similarly the use of relative value schedules is also blamed for the bias in the relative fee structure (Schroeder and Showstack 1979; Blumberg 1978). It is claimed that relative values are often based on actual charges and are not systematically related to the time and effort required to perform the service (Schroeder and Showstack 1979; Havighurst and Kissam 1979) Since fixed-fee schedules involve relative value schedules, either explicitly or implicitly, some researchers have called for a revision of relative value schedules. (See the testimony of Frank Sloan in the Massachusetts Blue Shield Hearing, 1978.) However, opinions vary widely regarding the method of effecting a departure from existing fee patterns. Negotiations between insurers and groups of providers are proposed by some (Glaser 1978). The Federal Trade Commission and others oppose this approach as well as the use of relative value studies to establish the relative fee structure (Havighurst and Kissam 1979). Both Havighurst and Kissam (1979) and Kallstrom (1978) favor fee negotiations between insurers and individual physicians as a means of avoiding antitrust violations. Kallstrom would permit the use of insurer constructed relative value schedules in these negotiations. The diversity of opinion about these alternatives testifies to the fact that there is no simple solution to the problem of physician reimbursement in a highly insured market.

THE PHYSICIAN-INDUCED DEMAND AND TARGET INCOME HYPOTHESES

Solutions to the problems posed by insurance might not suffice to guarantee effective functioning of the market. Another potential source of market failure stems from patient ignorance of medicine. Because of their limited medical knowledge, many patients delegate responsibility for their medical care to their physicians—including the ordering of procedures, some of which the physician himself may provide. Proponents of the physician-induced demand and target-income models assert that physicians abuse this agency relationship, that they induce their patients to demand an excessive amount of care. Dyckman (1978) argues that because of the combination of relatively complete medical insurance and physician abuse of the agency relationship, the laws of supply and demand no longer apply to the market for physicians' services.

Fuchs and Newhouse (1978) argue that the potential existence of physician-induced demand has profound implications for both the interpretation of medical economic data and policy formulation:

> How the physician acts—how perfect the agency relationship is—is of obvious importance. If the physician induces considerable demand (i.e., demand above and beyond what the patient would be willing to pay for if he knew as much as the physician), little normative significance can be attached to demands expressed in the marketplace. Observed demand curves (or observed willingness to pay) would reflect the physicians' manipulation of the patient rather than an informed patient's preferences. Normative claims of superiority for rationing mechanisms using coinsurance and/or deductibles begin to crumble. Manpower policy based upon estimates of demand is also in jeopardy. For example, queues for physician services cannot be used to establish the desirability of more physicians . . . because the legitimacy of the demand that the queue represents is in question. (pp. 9-10)

Evidence offered in support of physician-induced demand includes the following statistical relationships:

1) Physicians' fees are often higher in areas where the relative supply of physicians is greater (Newhouse 1979; Redisch, et al. 1977; Dyckman 1978).

2) Per capita utilization of medical services tends to be greater in areas where the relative supply of physicians is greater (Fuchs and Kramer 1972; May 1975; Newhouse and Phelps 1976; Davis and Reynolds 1976).

3) When physicians' fees were controlled during the Economic Stabilization Program, 1971-74, rates of increase in the number and complexity of Medicare services provided accelerated (Holahan and Scanlon 1978).

Proponents of the physician-induced demand and target-income models offer the following explanation for these empirical findings. An increase in the relative supply of physicians tends to provide the individual physician with fewer patients. In order to maintain his income in the face of reduced demand for his services, the individual physician raises his fees and/or expands the services he provides for his remaining patients. It is typically argued that the increased services take the forms of more elective surgery, additional tests, and return visits.

While the physician-demand hypothesis does not generally specify what determines the extent of this response, the target-income hypothesis postulates that physicians raise fees and/or expand services enough to earn whatever level of income they select as a target. For this reason, the target-income and physician-induced demand hypotheses are logically closely related. Physician-induced demand and target-income models have received only limited acceptance among economists because:

1) the models are logically incomplete (Ramsey 1980);
2) the empirical evidence can be interpreted in alternative ways, ways which do not imply that physicians are immune to market forces (Sloan and Feldman 1978; Pauly and Satterthwaite 1980; Fuchs and Newhouse 1978); and
3) the empirical evidence itself is subject to question (Ramsey 1980).

Theoretical Limitations

On the theoretical level, the physician-induced demand and target-income models provide incomplete explanations of physicians' behavior. The central problem for the physician-induced demand model is to specify a priori the extent to which physicians will exercise their ability to generate additional services and/or raise their fees. The existence of a target-income may appear to partially solve this problem. However, no satisfactory explanation exists of how target levels of income are determined. Reinhardt (1975a) has suggested that the target level of income is based on the prevailing income distribution in the community, but this idea has not been developed to explain how specific income targets are determined or how they vary among physicians. In addition, target-income models have not specified how physicians decide upon the appropriate trade-off between providing more services and charging higher fees in order to attain the target-income.

Furthermore, there is some evidence suggesting that physicians are subject to greater economic constraints than are typically implied by the physician-induced demand and target-income models. For example, studies have found that while fees are higher where physician density is greater, net incomes are lower (Sloan 1968; Benham, Maurizi, and Reder 1968).[5]

The difficulty of specifying these constraints a priori, so that physician-induced demand and target-income models become something more than post hoc explanations of empirical findings, is demonstrated by Evans (1974), Sloan and Feldman (1978) and Ramsey (1980). Evans outlined a model in which physicians' use of their power to induce demand for their own services creates disutility offsetting extra utility derived from the income generated by induced demand. The problem, which is acknowleded by Evans and clearly demonstrated by Sloan and Feldman, is that the model yields ambiguous predictions about the relationship between physician density and the other variables of interest: fees, hours of work, per capita utilization, and physicians' incomes. While the Evans model could be consistent with the empirical findings which the model attempts to explain, it could also be consistent with the conventional demand and supply model or any number of other models.[6] Ramsey (1980) shows that data necessary to test the physician-induced demand hypothesis are probably not available. He also suggests that the target-income hypothesis has been stated in such a way that it cannot be tested.

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[5] Redisch, et al. (1977) found no statistically significant relationship between net incomes and physician density.

Taking a different approach, Satterthwaite (1977) develops a monopolistically competitive model which explicitly incorporates the process of consumer search. His model applies to goods and services whose quality must be assessed by experience and need not be restricted solely to medical care. An important conclusion of his analysis is that it is not necessary to abandon traditional methods of economic analysis to explain the positive relationship between fee levels and physician density.

Contrasting Interpretations

The assumption of patients' ignorance about the medical services they receive plays an especially important role in the arguments of the proponents of physician-induced demand. For example, it is used to support the view that the greater per capita utilization of medical services in physician-dense areas is undesirable. An alternative interpretation is that the quality of care is higher in physician-dense areas. Redisch et al. (1977) found that in physician-dense areas, office visits are longer and make less use of allied health personnel as a substitute for the physician. The greater availability of specialists and hospital facilities in physician-dense areas also suggests that more complex care may be provided in these areas. In addition, increased physician density has been found to be correlated with decreased patient travel and office waiting time (Sloan 1977). Decreased time costs to patients in physician-dense areas could increase the demand for physicians' services in those areas with fees rising accordingly (House 1980; Fuchs and Newhouse 1978). Existing research does not support the view that the higher fees in physician-dense areas can be explained entirely by higher quality care in those areas, but research on differences in the quality of care is in the formative stage (Sloan and Feldman 1978). While there are many problems in attempting to determine whether care is excessive or insufficient, it is clear that in physician-dense areas care is more physician-intensive and a wider range of services is available.

At the heart of the issue regarding the interpretation of the empirical findings is a concept which economists call "consumer sovereignty." In most sectors of the economy, if firms sell a different product mix in geographically distinct markets, those firms are regarded as responding to differences in consumer preferences. That is, the consumer is sovereign in determining what goods and services are produced. However, in health economics research, a frequent assumption is that because the patient is a very poorly informed consumer of medical services, he accepts the physician's decision about what services are needed.

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[6] The fact that supplier-induced demand is not necessarily incompatible with the conventional demand and supply model has the following interesting implication: The intuitive plausibility of the supplier-induced demand phenomenon need not be rejected by those who still believe that the conventional demand and supply model provides a better vehicle for the analysis of market behavior.

Pauly (1978) has recently argued that the extent of applicability of the consumer ignorance assumption has been overstated. He argues that for a significant proportion of medical care purchases, information about the quality of care can be gathered from personal experience and the experience of friends. In addition, if enough people are well-informed, others can use price as an indicator of quality and need not become well-informed themselves. Finally, Pauly points out that in many cases physicians may be as uncertain about the value of a particular service as is the consumer (for example, there is considerable disagreement among physicians regarding the value of annual check-ups, the indications for tonsillectomy, etc.). Pauly asserts that this "irreducible uncertainty" will be irrelevant to the functioning of the market as long as consumers are aware of the limits of the physician's knowledge. In summary, Pauly suggests that, for those types of medical care which consumers purchase relatively frequently, information is "sufficiently extensive to permit an outcome at least as close to the competitive equilibrium as might occur with other 'usual' services."

Empirical Limitations

In addition to these theoretical and interpretive problems with the physician-induced demand and target-income models, some empirical evidence exists which raises doubts about the validity of the key empirical finding that physicians' fees are higher in areas where physician density is greater. For example, the studies of Steinwald and Sloan (1974) and Sloan (1976) found that the relationship did not hold for all specialties. Feldman (1976) found that adjusting office and hospital visit fees for quality differences had major effects: While the use of unadjusted fees yielded results inconsistent with his conventional demand and supply model, the use of quality-adjusted fees yielded demand and supply equations with the expected signs (negative and positive, respectively) for the fee variables. In addition, Dyckman (1978) found that when he controlled for both cost-of-living and regional differences, the relationship between fees and physician density became negative, although not statistically significant.

Pauly and Satterthwaite (1980) empirically tested the monopolistically competitive model developed by Satterthwaite (1977), which explicitly incorporates the process of consumer search. They find that when variables which account for rational consumer search are included in their fee equation, the positive correlation between fees and the physician-population ratio disappears. However, caution is warranted in interpreting their results because one of their measures of search costs, the number of physicians per square mile in the urban area, is highly correlated with the physician-to-population ratio.

Apart from the studies which have focused on the cross-sectional relationship between fees and the relative supply of physicians, some additional studies contain evidence on the empirical significance of physician-induced demand. Holahan and Scanlon (1978) investigated physicians' fees and incomes from Medicare and Medicaid during the price controls of the Economic Stabilization Program. Their principal finding, that the number and complexity of Medicare services increased more rapidly during the period of fee controls than either before or after controls, is suggestive of some demand generation on the part of physicians. However, it is equally plausible that price controls may have lowered the relative price of medical care[7] and stimulated patients' demand for Medicare services.

Held and Manheim (1978) attempted to find evidence of physician-induced demand in the treatment of hypertension in Quebec. This study is noteworthy for two reasons: 1) it is the only disease-specific study of induced demand; and 2) since Quebec pays physicians according to a fixed-fee schedule, physicians' fee responses were not an issue. The central finding of the paper is that both the annual cost of treatment and the number of visits per hypertensive patient were higher in areas of Quebec where the relative supply of general practitioners is greater. The authors interpret their results as indicating that induced demand exists in the treatment of hypertension, but that the magnitude of the effect is very small. The small size of the effect is interesting because the treatment of hypertension would seem to offer ample opportunity for extra visits, etc., due to the general nature of the disease.

Surgical Utilization and Physician-Induced Demand

An issue which has received considerable attention in the literature, and which is closely related to the topic of physician-induced demand is surgical utilization. Fuchs (1978), Gabel and Redisch (1979), Monsma (1970), and McCarthy, et al. (1978) have cited data on variations in the use of selected surgical procedures as evidence supporting either physician-induced demand or, in the case of McCarthy, "excess surgery."

There are sharp differences in surgery rates between areas within states, between nations, and between alternative payment mechanisms. Wennberg and Gittelsohn (1973) and Gittelsohn and Wennberg (1977) discuss wide variations in age-adjusted surgical procedure rates, and compute the probability that an individual will have a tonsillectomy and adenoidectomy by age 20 for thirteen hospital areas within the state of Vermont. The probabilities ranged from 9 percent to 60 percent. Bunker (1970) indicates that about twice as much surgery is performed in the United States as in England and Wales. Monsma (1970) and Gittelsohn and Wennberg (1977) present evidence that surgery rates are higher for employees with fee-for-service insurance coverage (e.g., Blue Cross/Blue Shield) than for similar employees with group health plans. Further, Fuchs (1978) and Bunker (1970) argue that high surgery rates are positively related to the supply of surgeons. For example, Bunker (1970) states that England and Wales have half as many surgeons and half as many surgeries (both per capita) as the United States; he also claims that similar comparisons can be made between surgeons and surgery rates within prepaid group practices versus the conventionally insured population.

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[7] The physician's fees component of the Consumer Price Index rose less rapidly than either the all items or all services components during the period of controls in the medical care sector, August 1971-April 1974 (Consumer Price Index, selected issues).

McCarthy, et al. (1978) investigated surgical utilization rates in two union health benefit plans. Members of the plans who were confirmed for surgery could receive, at no charge, a second opinion from the member of a panel of board-certified surgeons. In one plan, the (non-binding) second opinion was required for reimbursement for the surgery; in a second plan it was not. In both groups, McCarthy, et al. found that a portion of those who sought second opinions were not confirmed for surgery by the second physician. In addition, some of those not confirmed by the second physician chose not to have the operation.

These findings have been used as evidence of "excess" or "surplus" surgery. However, there are problems with measuring excess surgery by looking at the proportion of the "not-confirmed" group that chose not to have the operation. For example, Pauly (1979) notes that some individuals who were confirmed for surgery by both opinions also chose not to have the operation. Further, those who were not confirmed by the first opinion did not receive a second one; it is likely that some of these individuals would have been confirmed for surgery by a physician rendering a second opinion.

In order to evaluate the prevalence of "excess" surgery, one must first define "necessary" surgery. Pauly (1979) defines a specific operation as necessary if the fully informed patient chooses to have it, and unnecessary if the fully informed patient chooses not to have it. By fully informed, he means that the patient has "at least as much knowledge and understanding of possible costs and consequences as the physician." In deriving this definition, Pauly assumes that the patient pays the full marginal cost of the operation, and not just the part which is uninsured. In his definition, the necessity of an operation depends on both medical and economic considerations. It is founded on the patient's own evaluation of the costs and benefits—to him—of the surgery; accordingly, Pauly notes that one would expect differences of opinion on the necessity of specific operations.

Pauly's definition requires that individuals consider the full cost of the surgery. Because most individuals have insurance coverage for surgery, it is expected that the fully informed, insured patient might undergo surgery which he would consider unnecessary if he had to pay the full costs. The extent of this problem depends on the responsiveness of the demand for surgery to price. Because patients are not fully informed, their physician serves as their agent. In the physician-induced demand and excess-surgery controversy, physicians are said to abuse the agency relationship for their personal gain. From the patient's viewpoint, a "perfect" agent would recommend the identical course of action the patient himself would take if he were fully informed. Such an agent might recommend more services to insured patients than to uninsured patients. From society's viewpoint, however, the perfect agent would recommend those courses of action the fully informed patient would choose if the patient had to pay the full costs. Here the physician would recommend less care than the fully informed insured patient would choose for himself, and there would be no "excess" surgery. Thus, insurance creates an inconsistency between the views of the individual and society regarding the behavior of a "perfect agent."

Pauly (1979) argues that, other things equal, from society's viewpoint the perfect agent would recommend the lowest cost treatment. For many disorders, there are clinically acceptable surgical and medical treatments. Accordingly, surgical treatments would be recommended relatively more frequently in areas with relatively more surgeons, and medical treatments would be recommended relatively more frequently in areas with relatively more internists. In this regard, it is interesting to note that Pauly (1979) computed the costs and benefits of tonsillectomies for children and found that one cannot unambiguously conclude that there are excess tonsillectomies. What has been interpreted as physician-induced demand in surgical utilization statistics may, in fact, be evidence of a properly functioning agency relationship.

INCENTIVES AND ALTERNATIVE DELIVERY MODES

The discussion of physician abuse of the agency relationship is usually linked to the fee-for-service reimbursement system (Monsma 1970; Reinhardt 1975a, 1975b; Gabel and Redisch 1979; and others). It is claimed that fee-for-service reimbursement gives the physician a financial incentive to "overtreat" the patient. Moreover, it is claimed that the knowledge inequality beween patient and physician limits the patient's capacity to resist "overconsuming." In essence, it is argued that a physicians' services market dominated by fee-for-service reimbursement cannot be economically efficient. Accordingly, some critics, particularly those who accept the physician-induced demand and target-income hypotheses, believe that achieving economic efficiency in the market for physicians' services without increased direct governmental regulation requires the expansion of alternative delivery arrangements, such as certain types of HMOs, which provide the physician with a financial incentive to economize on the use of medical resources. Furthermore, it has been argued that competition with HMOs will improve the efficiency of the fee-for-service sector (Havighurst 1977; Goldberg and Greenberg 1977; Enthoven 1978a, 1978b, 1978c; Christianson and McClure 1979).

The premise in this line of reasoning is that the level of economic efficiency in the provision of health care services is largely determined by financial incentives given to the physician. The prediction that follows from this premise is that HMOs which use alternative methods of reimbursing physicians (e.g., salary, percentage arrangements) will be more efficient than traditional fee-for-service practice. This section discusses the evidence, mostly theoretical, that relates the financial incentives given to the physician to the economic efficiency of the physicians' services market. Further, this section examines the empirical evidence on the relative efficiency of HMOs and traditional fee-for-service practice.

HMOs can be organized in a number of ways that imply different financial incentives for physicians. Although prepayment by patients for at least part of their health care is characteristic of HMOs, physicians in HMOs may be paid in a variety of ways. In individual practice associations (IPAs), individual physicians are typically reimbursed on a fee-for-service basis. In prepaid group practices (PGPs), physicians are typically paid on a salary and/or share of profits (surplus) basis. (See Wolinsky 1980 for an HMO typology based on physician, patient, and organizational incentives.) Both theoretical and empirical research has been directed toward determining how those alternative reimbursement systems affect the practice of medicine and the costs of care.

Theoretical Analysis

Pauly (1970) argues that traditional fee-for-service practice provides the physician with an incentive to achieve least-cost production *in the office*, but at the same time provides him with an incentive to combine medical inputs inefficiently. Pauly argues that when patients have extensive hospital insurance traditional fee-for-service practice gives the physician an inducement to overuse the hospital relative to the office. In addition, as discussed previously above, attempts to explain statistical relationships between utilization and physician density have led some to argue that fee-for-service leads the physician to provide more than the optimal quantity of care to his patients.

The capitation payment system *for physicians* is not frequently used in the U.S. (Gabel and Redisch 1979). Under the capitation payment system, the physician receives a fixed payment to provide at least part of a patient's care (usually physicians' services) during a given period of time. It is argued that under the capitation system there should be a decrease in discretionary utilization across the board because any discretionary service utilization represents additional work effort for the physician (Wolinsky 1980). Pauly (1970) argues that capitation gives the physician an incentive to skimp on services, but that the desire to maintain a large panel may prevent flagrant abuse. Moreover, it is argued that capitation may result in an inefficient mix of inputs since the physician has an incentive to substitute medical resources not covered under the capitation contract for those which are covered (Pauly 1970; Gabel and Redisch 1979).

The physician's financial incentives with a straight salary arrangement are difficult to assess. On the one hand, it can be argued that the physician has no incentive to either over- or under-utilize medical resources in treating patients. On the other hand, it has been argued that the physician may reduce utilization to reduce his own work load (Wolinsky 1980). Pauly (1970) notes that physician incentives are difficult to determine a priori under the salary payment method since the method of determining salaries plays a large role in determining financial incentives. A problem for determining the effects of salary reimbursement of physicians is that it is usually associated with some form of organized framework of medical practice which exerts a group-discipline on the individual physician (Gaus, et al. 1976). Some claim that physicians are less sensitive to patients' needs and problems under the salary system (Glaser 1979).

When the physician's income is linked, at least in part, to the HMO's profit or surplus, the physician has a proprietary interest in the HMO. It can be argued that under profit-sharing it is to the physician's advantage to decrease expenses, and that providing less than the optimal quantity of care can be financially rewarding. However, the physician's income under profit-sharing also depends on the HMO's gross revenues. Consequently, analysis of financial incentives and, therefore, the usefulness of this type of theoretical inquiry is limited. Ultimately, the role of the physician's financial incentives and the potential for HMOs to improve the economic efficiency of the physicians' services market must be determined by empirical analysis.

Empirical Analysis

Two questions are of interest in reviewing the literature on the performance of HMOs. First, are HMOs—particularly prepaid group practice—more efficient than the traditional fee-for-service practice? If, for whatever reasons, HMOs provide health care services more efficiently than the traditional fee-for-service practice, a social policy of promoting HMOs may be justified. Second, if HMOs are more efficient than the traditional fee-for-service practice, what proportion of the efficiency gain can be attributed to the financial incentives that HMOs give their physicians? If it can be demonstrated that the use of alternative methods of reimbursing physicians significantly reduces the costs of health care, support would exist for the thesis that fee-for-service practice is inconsistent with economic efficiency.

An extensive literature exists on the performance of HMOs relative to traditional fee-for-service practice. Two recent reviews of this literature have reached roughly similar conclusions. Luft (1978), in a review of all significant HMO studies undertaken between 1950 and 1978, concludes that the evidence is clear that total medical care costs are lower for HMO enrollees than for individuals with conventional health insurance. However, Luft finds that the lower costs in HMOs can be attributed to a generally lower hospital admission rate in both the surgical and nonsurgical categories. Luft suggests three hypotheses to explain this finding: 1) HMOs indeed limit discretionary hospital admissions; 2) HMO enrollees may be basically healthier; and 3) HMOs may "undertreat" or traditional providers may "overtreat." Luft (1979) further considers the evidence and argues that the lower costs of HMOs are not due to lower quality of care or to more preventive care, but that new data indicates that people joining prepaid group practices tend to be substantially lower utilizers of hospital care prior to enrolling. If this analysis is correct, it implies that the apparent efficiency of HMOs relative to fee-for-service practice may well be illusory.

Wolinsky (1980) reviews the nine major review articles on HMO performance and also reviews HMO studies from 1978 to the present. He identifies a number of methodological deficiencies that pervade the HMO literature. These deficiencies limit the conclusion that can be drawn on the relative performance of HMOs and traditional fee-for-service practice. Nevertheless, Wolinsky's conclusions are similar to Luft's in that he attributes HMOs lower costs largely to lower levels of hospitalization but emphasizes that we do not know how or why HMOs achieve their lower hospitalization rates. These two reviews indicate that the evidence on the efficiency of HMOs relative to traditional fee-for-service practice is incomplete.

If existing studies of HMO performance have not determined whether or not HMOs are more efficient than traditional fee-for-service practice, then it follows that the literature has not demonstrated that a relationship exists between the physician's financial incentives and economic efficiency. Nevertheless, comparisons between independent practice associations using fee-for-service reimbursement and prepaid group practices using alternative methods of reimbursement consistently indicate that PGPs achieve lower costs (Wolinsky 1979). Monsma (1970) compared an HMO using capitation reimbursement of physicians with an HMO using fee-for-service reimbursement of physicians and found that fee-for-service reimbursement is associated with higher provision of physicians' services, particularly surgical services. However, he also found evidence that organizational structure significantly affects utilization. Gaus, et al. (1976) compared traditional fee-for-service practice with IPAs, which receive capitation payments from patients but pay physicians on a fee-for-service basis, and determined that capitation payments to the practice organization have little effect on hospital use. However, when the authors compared traditional fee-for-service practice to PGPs using alternative methods of paying physicians, they found PGPs had lower hospital use. Gaus, et al. suggest that physician payment methods and practice organizations are the major influence on hosptial use and note that with national health insurance (NHI) on the horizon, it is imperative that research determine the relative importance for costs of physician payment and practice organization. Luft (1979) argues that, with regard to the role of HMOs in promoting cost containment under NHI, caution is warranted because not enough is known.

It has been argued that competition among HMOs in a market area has the effect of increasing economic efficiency. Christianson and McClure (1979) assert that in the Minneapolis-St. Paul area competition among health care plans has increased the level of consumer information and improved access to medical facilities. Moreover, it is claimed that the emergence of HMOs improves efficiency by providing consumers with choices with regard to the financing and delivery of medical care. These types of improvements may not necessarily reduce price per unit of care but they do have the potential to increase the level of consumer satisfaction with the health care system. Further, if as a result of better information and more choice, consumers decide to reduce utilization of health resources, total health expenditures could decrease. Consequently, Christianson and McClure argue that any national health insurance plan should be structured in a way that does not restrict the development of competitive systems through private initiatives.

Existing studies comparing traditional fee-for-service practice with HMOs and studies comparing PGPs and IPAs have failed to separate the influences of physician financial incentives from the influences of practice organization, population characteristics, and quality of care. Consequently, it cannot be said that the evidence supports the thesis that HMOs are more efficient than traditional fee-for-service practice nor that the physician's financial incentives are systematically related to economic efficiency.

SUMMARY AND CONCLUSIONS

The debate over the extent to which traditional market forces can constrain provider and consumer decisions in the market for physicians' services has important implications for programs to contain health care costs. This review has surveyed the state of knowledge in three important areas of that debate: the impact of health insurance and the particular reimbursement methods which have developed with the expansion of both private and public insurance coverage; the physician-induced demand and target-income controversies; and the pros and cons of fee-for-service reimbursement of physicians versus alternatives such as salary and percentage arrangements.

The research on these topics provides some support for the view that the physicians' services market is different from other markets. The extent of insurance coverage, the limited information of patients about medicine, and the importance of quality of care all combine to modify the impact of traditional market forces. However, the research clearly does not support the view that market forces are inoperative in the physicians' services market. Upon careful inspection, there is little evidence that physicians are immune to the laws of demand and supply, as asserted by some proponents of the physician-induced demand and target-income models.

The debate over the extent to which market forces constrain economic decisions in the market for physicians' services can benefit from additional research. Many questions remain unresolved. The challenge to researchers is to determine the set of economic incentives that will lead to the allocative efficiency of a competitive market and also provide the risk-spreading benefits of health insurance.

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Health Regulation: Some Ideas on How to Improve It *by J. G. Atkinson**

INTRODUCTION

Despite the anti-regulatory sentiment currently prevalent in the U.S., it is clear that some amount of regulation with regard to the health care sector is inevitable. Since both the state and federal governments now pay for a large proportion of the health care costs of the nation, these governments will continue to construct laws and regulations regarding the extent of services to be covered and the amounts to be paid for them. Even if "competition" is perceived as a panacea, regulations will be promulgated to foster it.

The subject of this paper is the improvement of health regulation. The ideas on regulation presented herein have developed gradually over time as a result of the author's experiences with the Maryland Health Services Cost Review Commission (HSCRC), a regulatory agency established by the Maryland State Legislature in 1971.

The HSCRC operates as a quasi-judicial body with the authority to set rates of hospitals within the state. In this capacity, the HSCRC holds general public hearings on issues that affect the hospital industry broadly, and public hearings on individual hospitals at which the HSCRC staff, hospital representatives, and other interested parties have the opportunity to present evidence, cross-examine other witnesses, and be cross-examined. If any party is dissatisfied with the decision of the Commission after such a hearing, the next recourse is to the courts. Relatively few cases have been taken to court, and the ones that have are usually concerning the limits of the jurisdiction of the HSCRC.

The program has been successful in controlling costs while still retaining the support of the Maryland Hospital Association and most of the hospitals. The fact of its success is documented in the annual disclosure reports published by the HSCRC, by reports from the General Accounting Office (1980), and by Abt Associates (1980) for the Health Care Financing Administration. Throughout its regulatory life, the program has remained flexible, and, with the cooperation of the hospitals, a number of payment experiments have been tried. The results of two of these experiments are discussed in this paper.

Having established the inevitability of some amount of regulation in the health sector, the questions to be considered are:

1) How much regulation is appropriate?
2) What are the appropriate goals of a regulator?
3) How should regulations be designed in order to be most effective?

In the body of this paper, these questions will be discussed, a simple strategy for regulators will be described, and two case histories will be given. One of these will show the adverse consequences that have resulted from a regulation that was devised without application of a thought process such as the one suggested herein, and the second will concern a form of regulation which was devised with these ideas in mind.

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The general theme that underlies all the discussions in this paper is than the bureaucrat responsible for devising regulations almost invariably is less well equipped to know how to achieve the desired final goals than the individuals who are being regulated and are working full time in the field. Thus, the role of the bureaucrat should be to devise a system of incentives and penalties which encourage the regulatee to work towards the desired goals. This concept has always underlain the regulatory schemes used in Maryland, and this fact is probably a major reason for the success of the program and the retention of the support of the other parties involved, particularly the hospitals.

The topic for the first section is the definition of the goal of regulation, and included is some discussion of the differences between the health care industry and other more typical industries in which competition is effective. In the second section the basic strategy for designing a regulation is outlined and discussed. The third section consists of an analysis of a particularly bad regulation—the Medicare routine daily patient care limitation—and a poorly designed law. The fourth section consists of a discussion of the advantages of incentive regulation, both from the viewpoint of the regulator and of the regulatee. The fifth section consists of a description of a form of regulation that was devised with the principles described here in mind, and an account of its success to date.

THE DEFINITION OF THE GOALS OF A REGULATION

The first step in developing a regulation should be to decide what the aim of the regulation is; that is, what goal is the regulation trying to achieve? This may seem to be a simple-minded statement, but it deserves some examination. Regulators have a tendency to define their goals too narrowly, and to address symptoms of perceived problems rather than the causes. The result is that the regulators are straying from their field of expertise and interfering with the management of the regulated institution. This is generally detrimental to the efficiency of the institution, and in many cases, the result is not that desired by the regulators. Examples of this are manifold in problems associated with hospitals' attempts to comply with fire and safety codes. Different agencies have different, and sometimes contradictory, standards; and the standards are often excessively detailed and applied without consideration as to whether they are appropriate to a particular circumstance. This is an area in which it is clear that the individuals promulgating the regulations gave no consideration as to whether the funds that would be required to comply with them could be more profitably used for some other purpose.

In order to define the goals of a regulation, it is first necessary to consider why the regulation may be needed. In the case of hospital cost regulation, the reason is that the normal market forces are attenuated. In order for market forces to be operative, the consumers must have some minimal level of knowledge about the quality and value of the services they are purchasing, and this is rarely the case in regard to hospital services. Further, widespread hospitalization insurance has weakened the consumer's incentives to limit his hospital care expenses. Thus, it can be argued that the role of the rate regulator of hospitals is to attempt to strengthen market forces in the hospital sector.

STRATEGY FOR DESIGNING A REGULATION

The bureaucrat devising a regulation should go through the following steps:

1) Consider what the ultimate goal of the regulation is.
2) Devise a system of penalties and incentives which encourage the regulatee to move towards that ultimate goal.
3) Construct a regulation that embodies those incentives and penalties.
4) Analyze the regulation to ensure that it does not embody any perverse incentives.

Many regulatory disasters would have been avoided had the person drafting the law or regulation followed this simple thought process. The purpose of the first step is to ensure that the regulator is thinking about the problem in sufficiently general terms, and not simply addressing some symptom of the problem. The second step ensures that the regulator does not attempt to usurp the management prerogatives of the regulated institution. The purpose of the third step is clear, and the fourth step helps to ensure that no inadvertant damage is done.

AN ANALYSIS OF A LAW AND A REGULATION

In this section we will discuss a law and a regulation that were presumably written with the intention that they would result in cost savings, but which actually have the opposite effect. The regulation is the Medicare routine daily patient care cost limitation, and the law is the provision of the Omnibus Reconciliation Act of 1980 regarding payment for days of care in a hospital which would more appropriately be provided in a nursing home.

The Medicare Routine Daily Patient Care Cost Limitation

The routine daily patient care cost limitation was designed with the specific intent of controlling Medicare's costs for inpatient care. The regulations place an upper limit on the amount that Medicare will pay for routine daily patient care. The dollar limitation varies by geographic region, metropolitan or non-metropolitan location, and size of hospital. The first problem is that the limitation does not address the main reason why hospital cost inflation is substantially higher than inflation in the economy as a whole, namely, that the intensity of service being provided, mainly ancillary tests and procedures, is continually increasing. Over the period 1970 through 1978, the net service intensity increase was 4.5% (Freeland 1979).

The routine cost limitation places no limit on ancillary services, which are the driving forces behind hospital cost inflation. The limit is on routine costs which are much less of a problem. If it were the case that the limitation simply ignored the major problem that would be bad enough, but it actually encourages cost increasing behavior on the part of some hospitals. To illustrate why this is the case, an example would be helpful.

Consider a hospital running at a relatively low occupancy. Suppose the limitation on routine costs per day for that hospital is $100, that the hospital is budgeting 10,000 patient days at a cost of $110 per day, and that the marginal cost of an extra patient day is 50% of the average cost. Then, at the budgeted volume, the hospital would suffer a cost penalty of $10,000 x (110 - 100) = $100,000. However if the hospital increases its patient days by 25% to 12,500, its total cost will be (10,000 x 110) + (2,500 x 110 x .5) = 1,237,500, which is an average cost of $99. Since this is under the $100 limit, the hospital would not be subject to any penalty. This example should make it clear that if a hospital is in danger of exceeding the routine cost limitations, it has a strong incentive to drive up the number of days of care provided, either by increasing admissions or by allowing the length of stay to increase, or both. These strategies clearly increase the total cost of health care, even though they assist the hospital in beating the routine cost limitations.

Thus, the routine cost limitation, which was designed to try to control Medicare's payments to hospitals, not only fails to address the major driving force behind hospital cost inflation, but actually encourages the provision of excessive days of care.

Payments for Medically Unnecessary Days

The Omnibus Reconciliation Act of 1980 was signed by the President on December 9, 1980. Section 902, page 15 of this Act concerns payments for medically unnecessary days. The provisions are:

1) For hospitals with an occupancy rate below 80%, medically unnecessary days will be paid for at a rate that would be appropriate for a nursing home day, which is much less than the amount normally paid for a day in a general acute hospital.
2) For hospitals with an occupancy rate above 80%, the medically unnecessary days will be paid for at the same rate as medically necessary acute care days.
3) After two years, if it is technically feasible, medically unnecessary days will be excluded for the calculation of occupancy for the purposes of this provision.

The intention of this provision is clearly to attempt to discourage medically unnecessary days, and so to reduce the costs of the Medicare and Medicaid programs. It is obviously impossible at this time to present any empirical evidence as to the effect of this provision, but it is possible to make some predictions of its likely impact, and to explain the rationale behind these predictions.

The condition that medically unnecessary days are not to be included for the purpose of computing occupancy after the first two years means that the incentives for a hospital for the first two years are substantially different from the incentives thereafter. In the first two years, the hospital with an occupancy below 80% has an incentive to run up its admissions and its lengths of stay in order to boost its occupancy over the 80% threshold and thereby to obtain the larger payment for medically unnecessary days. This behavior will increase the number of medically unnecessary days and increase the total costs of the hospital—clearly not the outcome desired by the individuals drawing up the provision.

After the first two years, the medically unnecessary days are not to be included in the computation of the occupancy. There is, therefore, no incentive to increase them. However, the incentive still exists to boost admissions and increase length of stay for non-Medicare and non-Medicaid patients.

If I were an administrator of a hospital with an occupancy level below 80%, and my primary goal was to prevent any penalty to the hospital as a result of this regulation, then my strategy would be as follows:

1) Increase length of stay even though this results in more medically unnecessary days.

2) Increase admissions. This could be done by closing down the outpatient surgery program, if there is one, or by admitting more marginal cases, or by competing to attract physicians from other hospitals.

3) After two years, determine whether there was much risk of falling below the 80% occupancy threshold. If not, then there would be no reason to reduce the number of medically unnecessary days; and the discussion of the routine daily patient care cost limitation showed that it is advantageous to keep the number of days of care high. If the occupancy was likely to fall below 80%, then the incentive is to boost admissions or close beds until the hospital is safely above the 80% threshold, then the previous strategy becomes relevant.

Once again, we see an example of a law that was presumably drafted with the intention of saving expenditures for Medicare and Medicaid, but which is quite likely to have the opposite effect because of careless construction and a lack of consideration of the perverse incentives embodied in it. Another consideration is that the law is very inequitable. A figure of 80% occupancy appears on the surface to be reasonable, but if the hospital has a substantial number of medically unnecessary days and these are excluded from the occupancy rate computation, then the actual occupancy threshold may well exceed

90%, and would be very difficult to achieve even if the hospital is efficiently utilized in all respects other than the number of medically unnecessary days. Thus, the hospital has no reasonable way to avoid being penalized.

SOME ADVANTAGES OF INCENTIVE REGULATION

The regulator generally has been provided some broad social policy directives by the legislature. The role of the regulator is to interpret these broad directives, to draw up regulations to implement them, and to enforce these regulations. The legislature is the appropriate body to make social policy decisions, but neither the legislature nor the bureaucrats, with the task of translating these decisions into detailed regulations, are competent to instruct the managers of the regulated industry as to how they should run their day-to-day operations. The managers of the regulated industry are in a much better position to determine the details of how to achieve the overall goals desired by the legislature than are either the legislature or the regulator. They must simply to be given some incentives to do so. The first and most important advantage of incentive regulation is that it enlists the managers of the regulated industry in attempting to achieve the desired goal. It is, therefore, much more likely to be successful in achieving that goal than regulation which provides very detailed and specific directions to the manager which the manager may attempt to circumvent.

The second advantage is that the workload on the regulator is substantially reduced. Thus, the regulatory agency can operate with a smaller staff and budget. The task of the regulator is one of ensuring compliance with the regulations rather than monitoring in detail the actions or expenditures of the regulated industry.

AN EXAMPLE OF AN INCENTIVE REGULATION

Under the first rate setting system applied in Maryland by the Health Services Cost Review Commission, the factor that was regulated was the charge per unit of service, by department. For example, the Commission established the average charge per day in the Medical/Surgical unit, the average charge per relative value unit (American College of Radiologists) for Radiology. These rates were adjusted annually for the reasonable increase in factor costs, and for changes in the volume of service provided. The purpose of the adjustment for volume change was to ensure that the hospital did not under-recover or over-recover fixed costs if the actual volumes deviated from those originally budgeted. The incentive under this system is to produce units of service more efficiently, since the hospital keeps any savings resulting from efficiencies which result in its costs increasing more slowly than the inflation factor allowed by the Commission. There is no incentive, however, to control the amount of services provided to patients. In fact, there was an incentive to increase the volume of service, thereby reducing the average cost per unit by spreading the fixed costs of the hospital over more units. The response to the incentives to become more efficient can be seen by the fact that the financial condition of hospitals has steadily improved, although the rates were originally set so that the hospitals would break even. However, the response to the lack of (or negative) incentive to control volume of service is seen from the fact that while charges were rising at approximately 7% per annum, the cost per equivalent inpatient day was rising at 11% per annum.

An Incentive Based Rate Setting System

Observation of these rates of increase prompted the development of a hospital payment system which gives the hospitals a strong incentive to control the resource use per admission. Under this system, the Guaranteed Inpatient Revenue System (GIR), the hospital is guaranteed a certain amount of inpatient revenue. This amount is adjusted annually for reasonable inflation in factor costs, changes in the case-mix of the hospital, and changes in the number of admissions. It is not adjusted for changes in the amount of resources used per admission not justified by case-mix changes. If a hospital increases length of stay, or does more ancillary tests per admission, it will incur additional costs, but not receive any additional revenue. Conversely, if the hospital reduces its average length of stay, or does fewer ancillary tests per admission, it will have lower costs, but without a corresponding reduction in revenue. The incentive is clearly to reduce length of stay and ancillary services. (For a detailed discussion of the GIR, see Cohen and Cook 1978.)

The table below shows the rate of increase in cost per equivalent admission[1] from fiscal year 1977 to fiscal year 1978 and from fiscal year 1978 to fiscal year 1979 for the GIR and non-GIR hospitals separately. In 1978 there were 6 hospitals on the GIR for more than half the year, and in 1979 there were 13 hospitals on the GIR for more than half the year.

Average Increases in Hospital Cost per Equivalent Admission

Type of Hospital	Increase from FY 77 - FY 78	Increase from FY 78 - FY 79
GIR Hospitals	6.9%	9.9%
Non-GIR Hospitals	8.1%	12.8%

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[1] No. of Equivalent Admissions = No. of Admissions

$$+ \left(\text{No. of outpatient visits} \times \frac{\text{revenue per outpatient visit}}{\text{revenue per admission}} \right)$$

As can be seen, the rate of increase in hospital cost per equivalent admission was substantially lower in the GIR hospitals than in the non-GIR hospitals. This data demonstrates that the hospitals can, and do, respond to the incentives in the payment system.

Management Flexibility

The two hospital regulatory systems in use in Maryland have one important feature in common. Neither of them specifies how the hospital is to spend its money. Both establish a revenue which the hospital is permitted to generate and how the hospital uses that revenue is up to the management of the hospital. Also, the manner in which the hospitals respond to the incentives in the system is up to internal management.

In this way the hospitals can adjust their response to the areas in which they know they can make improvements. Some hospitals have reduced length of stay, others have concentrated on utilization of ancillary services. All have been successful in their goal of reducing resource use per admission.

At this point, it is worth mentioning that this is a clear instance in which the regulator is trying to correct for the weakened market forces, and the pressures being placed on the hospital management are, at least partially, the pressures that would exist if there were a well-functioning marketplace for health care services. If consumers of health care were concerned about the cost of their care, they would be shopping around and putting pressures of hospital management to control the charges. Then, as in the payment system just described, it would be up to hospital management to determine just how that would be accomplished.

SUMMARY

The argument made in this paper is that regulation is more likely to be successful if it provides incentives to the regulatee to behave in the desired manner than if the regulation attempts to provide very detailed direction to the regulatee. A simple procedure for ensuring the appropriateness of a regulation is presented. Two poorly designed regulations, and the perverse incentives they incorporate, are discussed in some detail. The argument of this paper is illustrated with an example of a form of regulation that was designed with these ideas in mind, and an empirical analysis of its effectiveness to date.

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Prospects for Regulation of the Health Care Sector in the 1980s *by Roger A. Reynolds**

GOVERNMENT INTERVENTION AND HEALTH CARE COSTS

Since the inception of Medicare and Medicaid, government intervention has had a growing impact upon the health care market. Certificate-of-Need laws and Professional Standards Review Organizations are but two significant products of the movement in the last decade toward greater regulation of the health care industry. Government has also assumed a greater role in this period in manpower policy to affect the supply and geographic and specialty distribution of health professionals. This trend has been consistent with the overall increase in scope and pace of government regulatory activity in recent years.

More recently, the political climate has shown increasing resistance to the growth of governmental regulatory activity. The leading example of deregulation has been that affecting the airline industry. Activities are also currently underway for easing the burden of regulation affecting the trucking, railroad, telecommunications, financial services, and other diverse industries. Will the recently developed sentiment for deregulation and regulatory reform spread to the health care sector? The defeat by Congress in 1979 of the Carter Administration's proposed hospital cost-containment legislation may seem indicative that it has already spread. On the contrary, this paper argues that the impetus of regulatory activity affecting the health care sector in the next decade will remain toward greater intervention by government.

In discussing this prognosis, the broadest possible definition is applied to the term "regulation." Regulation will be taken to include any form of intervention by government which has the intent of influencing the outcome of the market process. Although regulation is usually associated with activities such as fixing prices, imposing quotas, and limiting entry, the definition used here extends to tax and subsidy activities of government as well. This is not actually a fundamental extension of the analysis since taxation and subsidization policies can always be found to have identical effects with other forms of regulation. The definition of regulation is sufficiently broad to include a discussion of the prospects for national health insurance (NHI).

The primary force favoring greater intervention by government in the market for medical services is the burden placed on the budgetary resources of government in financing health programs. This is especially true at the federal level where personal health care expenditures increased from 3 percent to 10 percent of total federal expenditures between 1965 and 1978 (Executive Office of the President 1981a). Although part of the increased share of federal expenditures financing health services is attributable to the implementation of Medicare and Medicaid, spiraling costs have clearly exacerbated the burden of these programs since their implementation. Until the costs of medical care cease to rise so rapidly, it is likely that government efforts to moderate the rate of increases in health care costs will continue. At the same time, it is argued that support for any form of comprehensive NHI will continue to dissipate.

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THE THEORY OF REGULATION

One major basis for making these predictions is the theory of regulation. A short digression will therefore be made on the nature of the theory of regulation to provide some necessary background. The economic theory of regulation essentially asserts that those with the authority to institute regulations will choose to implement those regulations which maximize their expected net gains. Since, ultimately, most regulatory authority is vested in elected officials, the benefits and costs considered in this calculus can generally be put in terms of the impact that regulations would have in terms of political support of these officials from their constituencies. This includes not only votes directly swayed by a position taken on a given issue, but also support indirectly affected through the impact a position taken might have, for example, on campaign contributions.

The effective nature of most regulation is to redistribute income.[1] The success any group will have in obtaining favorable regulation depends on the benefits or votes the group is willing to supply relative to the costs or votes lost supplied by those opposing the regulation. The infrequency of voting for elected officials and the range of issues dealt with by officeholders tends to dilute the importance to most voters of their positions on most individual issues. Only for voters for whom the stakes are high on a given issue is it even worthwhile to exert the effort to learn the position taken by regulators on the issue. It follows that favorable regulation is generally achieved by groups in those cases in which the interests of each member of the group in obtaining the regulation is relatively strong, while the cost to individual members of groups that stand to lose as a result of the regulation is quite small (even though the aggregate loss may be large).

This brief summary of the economic theory of regulation reflects recent developments in the theory which have greatly reshaped and refined past thinking on the subject (Stigler 1971; Posner 1974; Peltzman 1976). Two main alternatives have been proposed in the past which the current theory supplants. One is the public-interest explanation for regulation. According to this view, the purpose of regulation is to overcome abuses and imperfections of the market and thereby improve society's welfare. The net welfare gain from regulation is the sum of the individual income gains and losses resulting from regulation. There are several major types of market failure which regulation can mitigate: 1) the existence of natural monopolies, such as public utilities, occurring because of increasing returns to scale in production; 2) the lack of complete information by either consumers or producers in the market; 3) the occurrence of externalities in production, such as pollution, which impose costs upon society not properly reflected in the prices of products; and 4) the existence of goods, such as public defense which are beneficial to society but for which individuals by themselves have little incentive to produce.

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[1] The form of the redistribution need not be directly in money, but may rather be in terms of goods or services.

There are many examples of regulation affecting the health care sector which may be justified as alleviating the effects of market failure. Licensing of health professionals assists in overcoming difficulty consumers have in judging the qualifications of providers of care.[2] Public health initiatives to control communicable disease recognize the fact that individuals have the incentive to underinvest in communicable disease prevention since they value only those benefits accruing to themselves and not those benefits derived by the rest of society from their own efforts to avoid such diseases. Government grants for basic medical research are necessary to provide an incentive to engage in research since individuals contributing to the increase of basic knowledge have no means of appropriating all of the benefits of their efforts.

Although the public-interest rationale represents a proper economic justification for regulation, it is defective as a theory of regulation in two respects. First, this rationalization is of little use in explaining the observed pattern of regulation. Trucking, stock brokerage, and air transportation, for example, have all been regulated at the federal level, but in none of these cases can it be convincingly argued that any type of market failure existed. Many regulations have, in fact, been shown to have a net detrimental effect on the economic welfare of society. Second, the public-interest explanation of regulation provides no articulation of how policies perceived to have the potential of increasing social welfare are translated into legislative mandates. As pointed out by Posner (1974), it is relatively simple to imagine examples in which there is a conflict between principle, as embodied in the public-interest view of regulation, and the individual interests of the majority of voters.

The other theory of regulation proposed in the past is the capture theory. This theory asserts that regulation is introduced as a means of protecting existing industries from competition and giving government sanction to cartel-like behavior by firms. Again, there are both logical and empirical objections to this theory. In particular, there is no reason given in this theory as to why the interests of groups other than existing producers are neglected by regulators. Many recent regulatory initiatives, in fact, may be regarded as providing benefits largely to consumers while imposing costs on producers.

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[2] A competing explanation for licensing is that it restricts entry into the practice of medicine, increasing the incomes of those successful in gaining entry. (See Leffler 1978.)

The newer economic theory of regulation often provides predictions consistent with regulation being "captured" by producers since producer interests are generally more concentrated than those of consumers. It provides more flexibility than the capture theory, however, in admitting that intervening circumstances may cause relative concentrations of interests among groups to vary. It also provides an explanation of the behavioral forces underlying regulation in asserting that government officials acting in their own interests impose regulation to maximize their own advantage weighing the benefits offered them by those who stand to gain and the costs threatened to be imposed on them by those who stand to lose as a result of regulation. In these respects the economic theory of regulation provides a more adequate basis for making predictions concerning prospects for future regulatory activity. It is important at the outset to emphasize, however, that predictions based on the theory of regulation carry, by themselves, no implication for the welfare effects generated by regulation.

In applying the theory of regulation to deduce predictions about the future of regulation of the health care sector, economic trends of the sector provide important evidence. Expenditures for health care in the United States increased from $43 billion in 1965 to $212 billion in 1979. This growth caused health care expenditures to increase as a percent of gross national product from 6.1 percent to 9.1 percent in the period from 1965 to 1979. (See Gibson 1980.) About 40 percent of the increase in expenditures was due to the increase in the medical care price index with the remainder resulting from increased amounts of care being provided and changes in the quality of care.[3] Although rising health care costs have received widespread publicity and have affected all segments of society, little political support can be expected to be generated by general public concern in favor of regulatory efforts to control health care costs. Health care costs are still a sufficiently minor concern for most individuals, compared with other concerns on which individuals choose to base political support of public officials, that it is not likely to be a source of much attention by regulators. For a similar reason, concern over health care costs cannot be expected by itself to generate support for NHI.

There is, however, an indirect source of significant political support for regulation to contain health care costs. This support is derived from the large role government has come to play in financing health care expenditures. While, in 1965, only 21 percent of personal health care expenditures were publicly financed, now close to 40 percent of personal health care expenditures are financed by government (Gibson 1980). The largest part of the increase in the share of government expenditures has been due to increases in expenditures for Medicare and Medicaid. This has two implications. First, the expanded role of government in the health care market gives it some monopsony power to control prices of services it purchases. The incentive is for government to set these prices at less than the competitive level.

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[3] The medical care component of the Consumer Price Index rose by 145 percent exceeding the growth of the Consumer Price Index for all items of 107 percent from 1965 to 1978.

Second, the government itself now bears a large portion of the impact of higher medical care costs and has its own vested interest in controlling these costs. The alternatives to attempts to directly control the growth of health care costs available to government in meeting the costs of its health programs are to: 1) cut benefits of its health care programs; 2) raise taxes; or 3) reduce expenditures for non-health related activities. To some degree each of the last two strategies mentioned has been employed already, as manifested in the absolute and relative growth of government expenditures for health care. The use of these alternatives, however, has reached a point of becoming more costly to government agencies than direct regulations aimed at controlling the increasing cost of government health care programs.

Resistance to further tax increases is mounting. Reduction in non-health programs infringes on benefits that other groups reap from government activity and is likely to result in increasing costs being imposed on government officials should it continue. The gains of individual beneficiaries of government health programs, especially the elderly and poor covered by Medicare and Medicaid, are quite significant relative to their other political concerns effectively foreclosing on the option of reducing benefits of existing health programs as a viable course. This is tacitly admitted by the federal government in placing 75 percent of proposed federal outlays for health in fiscal year 1981 in the category of uncontrollable expenditures. In contrast, regulatory efforts to control costs may be designed to place a larger proportionate burden on providers of health services than do the alternatives. Although organizations of providers in the health care sector have been quite effective in gaining favorable regulation in the past (see, e.g. Kessel 1958, 1970), they represent a relatively small constituency compared to other groups with competing interests related to the problem of the cost of government health programs. The opposition which providers can muster is not likely to forestall regulation of health care costs that is detrimental to their interests in view of the degree of opposition to the alternatives.

The prospects for NHI may be considered separately. The nature of the argument usually advanced on behalf of NHI is that, for some reason, the current system of financing health services has given rise to inadequate health insurance coverage for some segments of the population. The political force of this type of argument depends on the ability of those segments of the population, which believe they can gain from NHI, to identify themselves and lend visible political support to passage of an NHI proposal. Little support of this type has developed.

Although many NHI plans have been presented in bills before Congress, no NHI bill has ever been reported out of a committee of Congress.

It seems even less likely that an NHI bill will make such progress in the future. In 1977, 85 percent of the population was covered by private insurance or public medical programs for at least basic hospital room and board costs and 90 percent had coverage for inpatient laboratory and x-ray fees (Sudovar and Feinstein 1979). As a result of the availability of health insurance, out-of-pocket expenditure for health services declined from 40 percent of total personal health costs in 1970 to one-third in 1978. This suggests that the political base of support for government-mandated health insurance covering the entire population is quite small and shrinking. Since groups currently lacking coverage for different kinds of care (who would be the main beneficiaries of NHI) have been unable in the past to form any sustainable coalition with any impact, it does not seem likely that in the future an effective coalition supporting NHI can be formed. The government already subsidizes the purchase of health insurance for the employed population mostly through the income tax exemption of employer-paid health insurance premiums. With continued inflation the rate of this subsidy will increase as nominal wages and incomes increase because the marginal tax avoided by taking income in the form of health insurance benefits will increase. This force creates the incentive for coverage of health care costs under private health insurance to continue to increase in the future. Any base of support for NHI may thus be expected to erode further.

More extensive coverage of health care costs by private health insurance in the future will also cause continued increases in the demand for health services putting further upward pressure on health care costs. Another source of increasing demand and higher health care costs in the future is the increasing share of the elderly in the population which will cause a larger proportion of the population to be covered by Medicare. In the next 50 years, the elderly population is expected to double absolutely and proportionately to 22 percent of the population. This also means that the continued upward pressure of demand on health care costs will likely be accompanied by continuing increases in the share of costs financed by government under existing programs. In summary, it can be concluded that, while the incentive to institute NHI will dissipate, the incentive for government to regulate health care to contain costs of the health care programs it finances will continue to grow.

RECENT GOVERNMENT REGULATION AND POLICY AFFECTING HEALTH CARE

The difference in the trend toward greater intervention affecting the health care sector and the broad range of activity designed to curtail the burden of regulation on the rest of the economy is reflected in a review of recent regulations and policy initiatives already imposed and still pending to control the allocation of resources for the delivery of health care. Major forms of new intervention already in place include the following:

- Certificate-of-Need (CON) laws now place control by public regulatory agencies over certain capital expenditures by health care providers. The National Health Planning and Resources Development Act of 1974 (P.L. 93-641) requires that all states receiving federal funds for health programs institute CON programs.

- Eighteen states now require disclosure, review, or regulation of hospital rates and budgets. In six of these states, laws provide for prospective review and approval by state agencies of hospital rates to be charged all patients in the state.

- Professional Standards Review Organizations (PSROs) are mandated under the Social Security Act Amendments of 1972 to review medical services provided under Medicare, Medicaid, and the Maternal and Child Health Programs for compliance with professionally recognized standards of quality, medical necessity, and cost-effectiveness.

- The Health Professions Educational Assistance Act of 1976 (P.L. 94-484) effectively places restrictions on the number of places in non-primary care specialties relative to primary care specialties in graduate residency training programs. Federal health manpower policy has also become increasingly active recently in attempts to restrict the total supply and geographic distribution of physicians.

- Health maintenance organizations (HMOs) have received encouragement and subsidization by the federal government in an attempt to regulate the organization of health care delivery.

In 1979 alone, the federal government increased its outlays for regulatory activity related to health by 35 percent to nearly $3 billion.

Other proposals being made and pending action by administrative or legislative bodies support the view that the future trend for the health care sector is toward greater regulation.

- The Federal Trade Commission has been pursuing the placement of limitations on professional ethical restrictions with regard to advertising by physicians.

- Several proposals have surfaced at the state level designed to regulate physician supply. A report by the California Office of Statewide Health Planning and Development recommends a nearly 50 percent reduction in residency

> positions in the state. Recommendations for a certificate-of-need approach to physician licensure have appeared in Rhode Island and Hawaii. In New York, a recommendation has been made to curtail state reimbursement of residency program costs in areas where there is deemed to be an oversupply of physicians.

This review, of course, is far from a comprehensive listing of all government activity affecting the market for health services, but it does include many of the more important recent initiatives. It is also sufficient to support the conclusion that government intervention in health care has indeed increased from a variety of sources and is taking an increasing array of forms.

Although government intervention in the health care market has been diverse in source and specific content, the major common theme implicit in rationales for recent regulation may be identified as concern over rising health care costs. The rationales for intervention assert that the usual market forces fail to bring about a socially desirable distribution of resources. The resulting inefficiency leads to higher medical care costs which can only be overcome by government control. The evidence supporting the hypotheses used to predict the effectiveness of recent regulation in stemming this growth, however, has been weak.

One deficiency often attributed to the market for medical services is a lack of competition. Limiting professional ethical restrictions on advertising and encouraging the development of HMOs have both been seen by their proponents as methods of promoting more competition. The claim that the medical care market is not competitive is itself vague, but generally relies on the view that patients have a difficult time obtaining information about the cost and quality of care from alternative providers. This gives physicians little incentive to compete for patients by keeping the price of given qualities of care to a minimum. Advertising is thought to overcome this difficulty by making information more available to patients, while HMOs are believed to encourage competition by providing the incentive for physicians to minimize the cost of care through capitation payments for services.

The detractors of advertising view it as an anti-competitive force and as leading to cosmetic product differentiation which misleads consumers in evaluating the qualities of products. A conclusive theoretical or empirical case has not been established for either of the opposing views of the effects of advertising (Comanor and Wilson 1979). The arguments supporting the efficacy of HMOs in increasing competition are also suspect. A review of the literature concerning the performance of HMOs by Wolinsky (1980) concludes that although the costs of health care delivery in HMOs are lower than under other delivery modes, research designs used "have . . . not been framed clearly enough to provide conclusive evidence to support or reject the hypothesized effects of the incentive or disincentive structures [of HMOs]." In particular, there is the possibility that the lower cost of care in HMOs is an artifice resulting from the selection of patients and providers into alternative delivery modes rather than it being a reflection of greater efficiency. The favorable regulatory treatment being given HMOs relative to other modes of care is, in any event, anti-competitive in nature. There is little sound evidence, therefore, to support the views that advertising by physicians and the development of HMOs will result in patients incurring lower costs for health care in the long run than at present.

A second problem with the health care market, it is often argued, is that patient ignorance of medicine allows physicians to manipulate patient demand to achieve their own income goals and nonpecuniary preferences. According to this view, since patient demand poses no effective constraint on the ability of physicians to earn income, in contrast to the situation of a usual market, it follows that the secular increase in physician manpower in the United States is by itself leading to increasing costs of medical care; that is, physicians provide medically unnecessary services to their patients and choose their specialty and location of practice without any concern for possible adverse economic consequences. These results lead to the delivery of an overly expensive mix of services and to a maldistribution in the availability of care. These arguments have been used to justify recent developments in government health manpower policy and utilization review by PSROs.

The hypothesis that physicians induce their own demand has gained popularity largely based on its intuitive appeal. Although much evidence has been cited as supporting the physician-induced demand hypothesis, the hypothesis has never actually been stated in such a way that it is capable of being refuted. The alternative hypothesis, that patients do possess their own well-informed demands for medical care, has also not been conclusively refuted (Sloan and Feldman 1978; Ramsey 1978; Cotterill 1979), even though it is capable of quite different predictions about the effects of policy. For example, since the physician-induced demand hypothesis predicts that fees may increase with physician supply, it has been used as a justification for curbing federal subsidies for medical education in order to slow the growth of the physician population. The view that physicians do not significantly affect demand, on the contrary, predicts that limiting physician supply will necessarily result in higher fees. While the physician-induced demand hypothesis is quite common as a justification for government intervention to control health care costs, it remains little more than a conjecture which remains to be validated empirically.

Another supposition serving as a basis for regulation has been that methods of reimbursement used by insurance plans and government programs for health care services eliminate the incentive for providers to produce care efficiently and cause consumers to demand excessive amounts of care, resulting in excess capital capacity in the health care industry. This has been used as a rationale for CON laws and controls on fees, hospital rates, and expenditures proposed and already in effect in some states. Although there is some consensus that current reimbursement schemes are a source of inefficiency in the health care market, the use of regulation to correct them implies that regulation can be designed by legislators and administrators in such a way as to avoid greater inefficiencies than may now exist. There is no basis for believing that regulators possess the skills necessary to improve upon the results obtained by the professional judgment of physicians and other health professionals in direct consultation with patients.

Several conclusions may be inferred from this discussion of rationales for recent forms of government intervention affecting the health care sector: 1) The cost of health care directly and indirectly has been the dominant underlying concern of government intervention affecting the market for health care since the implementation of Medicare and Medicaid. 2) Major regulatory initiatives have been based on assumptions, which have not been adequately tested, about the nature of the health care system and about the ability of government intervention to perform better than the economic structure of the market in controlling health care costs. 3) The potentially spurious rationales for recent regulatory activity may mean that much of this activity will have unintended and undesired consequences.

If regulations already imposed are effective in stemming the growth of government health care expenditures, it might be expected that there will be relatively fewer new regulations in the 1980s. The results of implementing regulation on the basis of less than well-understood evidence, however, is bound to be a disappointing and, possible, costly experience. The results of several studies of recently implemented forms of regulation tend to confirm this view. CON laws, for example, appear to have had a weak impact at best on hospital investment. The effects have been compensated for by increased investment in anticipation of the implementation of regulation, increased investment in types of assets not as closely scrutinized in regulatory proceedings, and increased outlays for other inputs such as personnel. This indicates that CON has actually had either no effect or a positive effect on average hospital expenditures rather than the desired negative effect (Sloan and Steinwald 1980; Salkever and Bice 1976; Hellinger 1976). The initial effects of PSROs and prospective reimbursement schemes also seem disappointing (Executive Office of the President 1981b). This provides additional support to the prediction that there will be pressure for further regulation of the health care sector in the future.

CONCLUDING REMARKS

This article has argued that the course of regulation in the health care sector will be concerned primarily with containing the cost of existing government health care delivery programs in the next decade. The prediction that there will be further growth in regulation to achieve this goal has been based on the economic theory of regulation and the questionable validity of the rationales underlying recently initiated regulations. A few further points remain to be discussed.

The predictions developed are in conflict with the capture theory and perhaps also the public-interest theory of regulation. The capture theory would maintain that organized medicine would be the major beneficiary of regulation, but it has been argued here that, in this instance, just the opposite is occurring and will continue to occur with organized medicine being the major loser. Although the theory of regulation predicts that producers generally have greater potential to obtain favorable regulation than consumers (and it has been asserted that organized medicine has, in fact, been the beneficiary of favorable regulation in the past), the growth of the public sector's role in financing health care has been responsible for creating competing interests which outweigh those of organized medicine in allocating benefits of regulation.

Many recent regulatory initiatives have been directed at controlling the cost of health care whether or not the care is publicly financed. This may seem inconsistent with the argument that the cost of publicly financed health care is the main focus of concern over rising health care costs rather than general public concern. There are three explanations for why a course of controls exclusively confined to costs of government health care programs has not been pursued. First, controls directed at government programs alone would inevitably result in discrimination against those eligible for benefits under these programs. This result would be in conflict with the interests of regulators to avoid placing costs on beneficiaries of existing programs, as explained earlier. Second, efforts to control costs of health care, independent of the source of financing, extends benefits to all health care consumers so that the relative size of the base of opposition to regulatory initiatives from providers is narrowed. Finally, while emphasis has been given in the discussion thus far to the cost of direct government health care programs as the source of government's concern over the problem of rising health care costs, tax revenues not realized as a result of tax provisions subsidizing the private purchase of health insurance represents another, albeit less visible, drain on the resources of government created by rising health care costs. Because the revenue loss to government increases with increased health care costs of all taxpayers, the fiscal burden of increasing health care costs on government is not actually confined to its direct outlays for the provision of health care services to a limited segment of the population.

The formidable effort by organized medicine put into defeating the Carter Administration's hospital cost-containment bill indicates that the interests of providers of health care have not lost all political clout. In addition to the direct lobbying effort against the hospital cost-containment bill, organized medicine has responded to the threat of regulation with the Voluntary Effort to Contain Health Care Costs (VE). This program may be viewed as a sign of organized medicine's recognition of its vulnerability in the current regulatory environment since there would be little incentive for maintaining the VE in the absence of the threat of regulation. The VE is also likely to have little effect in the long run. Although providers may collectively gain from compliance with a voluntary standard to slow the growth of costs (in order to avoid more stringent regulatory standards being imposed), each provider individually has the incentive not to comply in order to maximize its own gain. Any voluntary compliance with a standard which conflicts with the interests of individual providers cannot be stable in the long run.

In 1979 the major components of the medical care component of the Consumer Price Index—physicians' services, dental services, hospital room charges, prescription and nonprescription drugs, and medical supplies—all increased at rates lower than the overall rate of inflation. This may or may not have been a short-run effect of the VE, but the Carter Administration expressed some dissatisfaction even with these results. This reaction is consistent with what might have been expected based on the above discussion for two reasons. First, the market power of the government in purchasing health care means that it is not merely interested in obtaining relative stability of medical care prices with other prices, but rather a lower relative level of medical care prices. Second, government health costs have continued to spiral, so the relative stability of medical care prices has not mitigated the strain placed on the fiscal capacity of government by its health care financing programs.

The foregoing discussion has avoided any explicit concern with the welfare effects of regulation in the health care sector. This has instead been a positive exercise in assessing the course that regulation affecting the health care sector may be expected to take in the future. The overall conclusion is that regulation will continue to increase until an effective solution is found to the problem of rising health care costs. The nature of proposals which have the greatest likelihood of being implemented, in the meantime, are those which give the predominant share of benefits to government and impose the greatest share of costs on providers of health care services. The questions raised over the validity of theoretical rationalizations advanced for recently implemented forms of regulation intending to control health care costs indicate that a greater consensus needs to be achieved in understanding the behavior of the health care system. Without such a consensus, any evaluation of welfare effects of regulation affecting the sector will be controversial. What this suggests is that more serious research on the behavior of the health care system is needed. In the meantime, assumptions about the health care market which have not been supported by rigorous evidence must be treated with greater skepticism, and their use to rationalize new regulation should receive greater scrutiny.

A POSTSCRIPT

This article was originally written before the 1980 election. The new Reagan Administration has already indicated a distinctly more belligerent attitude toward regulation in general and proposed narrowing the scope of some major federal regulatory programs affecting the health care sector. It has also proposed placing a direct cap on the growth of federal contributions to the Medicaid program in the future and giving greater discretion over the program to individual states.

It is too early to predict what will happen to the Reagan proposals, but several points are worthwhile to note. The caps proposed for federal Medicaid expenditures will have only a relatively minor impact on overall federal health expenditures. The Medicare program, the largest federal health program, has been untouched by the proposals. At the same time, the states will be faced with demands to replace some federal Medicaid dollars if the Reagan proposals are implemented which would give them the incentive to exert greater regulatory authority to control health care costs themselves.

Some temptation exists to hedge or retract the prediction made above that regulation of the health care sector is likely to increase in the next decade. The predictions, however, were based on the reality of the problems of government health care program costs and the relative strengths of the constituencies affected by these programs. These realities appear likely to persist. I have, therefore, chosen to leave the article and my predictions largely intact.[4]

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[4] Two brief points about Carter hospital cost-containment proposals which seemed particularly irrelevent at this point, however, were dropped.

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Part II—Health Services Research and Policy Analysis: Selected Papers

The six articles in this section cover a diversity of current research and policy issues concerning health care delivery systems. The papers were selected on the basis of their relevance to health care issues in the 1980s. These issues include: physician manpower supply and its impact on hospital and physician expenditures; HMO performance and its linkage to HMO organizational structure; the economic status of resident physicians; physicians' fees, incomes, and expenses; and trends in the prices of medical care services.

In "Long-Run Forecasts of Prices and Expenditures for Physician and Hospital Services," Jack Rodgers uses the Bureau of Health Professions' current model of the physicians' services market to forecast health care prices and expenditures. Based upon projections covering the period 1975-1990, the author concludes that the growing number of physicians will result in a decline in real (inflation-adjusted) prices for physicians' services and an increase in the real prices for hospital services.

Fredric Wolinsky and Barbara Corry, in "Organizational Structure and Medical Practice in Health Maintenance Organizations," also address the issue of competition in the physicians' services market. Specifically, the authors examine practice characteristics of a national sample of HMO physicians to determine whether or not hours practiced, patient load, waiting time, reimbursement patterns, and incomes and expenses significantly differ across the three types of HMO organizational models.

The conditions under which resident physicians labor have long been a controversial topic. Many believe that the resident's work situation is characterized by low salary, long working hours, frequent on-call duty, and little collegiality with hospital medical staff. Douglas Hough investigates the validity of this perception by examining the results of the AMA's 1979 Survey of Resident Physicians in his article, "The Economic Status of Resident Physicians: Results from the Survey of Resident Physicians."

"The American Medical Association's Periodic Survey of Physicians" by Louis Goodman and Lynn E. Jensen assesses the progress and problems associated with the AMA's Periodic Survey of Physicians (PSP) over the past decade. The article details the operation of the PSP, focusing on response/non-response studies and survey experiments conducted by the AMA Center for Health Services Research and Development. The paper concludes with an examination of future directions for the PSP and its role in health services research.

"Trends in Physicians' Incomes, Expenses, and Fees: 1970-1980," by David Goldfarb, reports data from the most recent AMA Periodic Survey of Physicians. The article provides an analytical overview of economic trends in the practice of medicine.

In "Relative Changes in Medical Care Prices: The Consumer Price Index, 1970-1980," Gerald L. Glandon updates and expands similar analyses from previous editions of Profile. Particular emphasis is placed on changes in the physicians' services component of the Consumer Price Index relative to other components of this index during 1980.

Long-Run Forecasts of Prices and Expenditures for Physician and Hospital Services *by Jack Rodgers**

INTRODUCTION

This paper reports on the use of an econometric model to forecast long-term movements of prices and expenditures in the physician and hospital services sectors. Presented are preliminary forecasts generated by the current version of the model. Of special interest are the implications of the forecasts for federal support of medical education and regulation of hospital construction. Since the effectiveness of past policies in these areas in achieving national health care and cost-containment goals is currently at issue, the forecasts should be of interest to policymakers.

The model to be discussed represents the current status of research conducted for several years in the Bureau of Health Professions. The object of this research is to develop a capability to forecast national health care prices and expenditures in each of the major service categories—dental, physician, hospital, pharmacy, and long-term care. Forecasts of dental prices and expenditures have been reported elsewhere. (See Hixson 1980, Hixson and Mocniak 1980.) The forecasts presented in this paper were generated by an econometric model which has been documented previously. (See Hixson 1979.)

This report begins with a brief description of the Bureau of Health Professions' econometric model, which uses an orthodox microeconomic approach to estimating supply and demand relationships. The next section shows how values for the exogenous variables were projected to 1990. This is followed by the forecasts of prices and expenditures in the hospital and physician services sectors to 1990. Finally, implications of various federal health policies are examined in the concluding section.

DESCRIPTION OF THE MODEL

The concept underlying the model's specification is that aggregate prices and expenditures for the health services in question are equilibrium quantities determined by the market interaction of supplies and demands. The aggregate demand for each service is generated by two distinct populations: the "uninsured," who pay the full market price for services, and the "insured," who pay a "net" price which is less than the full market price paid by the uninsured. The concept is illustrated in Figure 1, which depicts the equilibrium condition. In Figure 1 the

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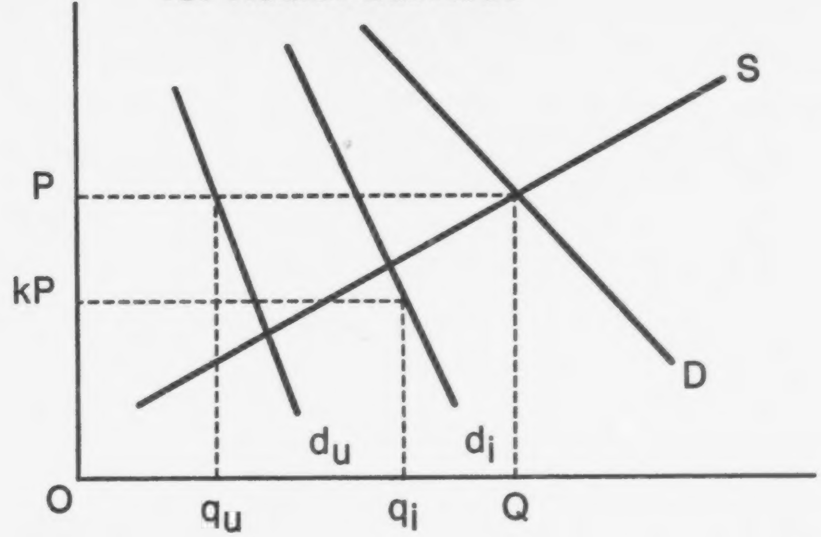
Figure 1—Aggregate Demand and Supply Curves for Health Services



aggregate demand function, D, is the sum of the demand of the uninsured, d_u, and the insured, d_i.

The demand curve of the insured can only be plotted for a specified value of the proportion of the full price paid by the insured, denoted by k; therefore, the position of the aggregate demand curve, D, is a function of k. For a given supply curve S, the equilibrium full price, P, and the proportion, k, of the full price paid by the insured must be such that the sum of the quantity demanded, q_u, by the uninsured and that by the insured, q_i, equals Q, the quantity supplied at the full price, P. A coordinate pair (P,Q) lies on both the aggregate demand function and the aggregate supply function. These are jointly determined dependent variables. The model is an orthodox competitive market equilibrium construct. Attempts to incorporate considerations of supplier-induced demand (e.g., by including physician/population ratios in the demand functions) have not been successful.

Since physician and hospital services are often consumed jointly, the model of physician services includes equations for the demand and supply of hospital services. The behavioral and aggregated equations of the physician services model are as follows:

The average annual quantities of physician and hospital services demanded by each uninsured person are given, respectively, by

$$q_{ut} = a_o + a_1 p_t + a_2 y_{ut} + a_3 r_t \qquad (1)$$

$$z_{ut} = b_o + b_1 p_t + b_2 y_{ut} + b_3 r_t \qquad (2)$$

where p_t and r_t are the prices of the respective services and y_{ut} is the per capita income of the uninsured in year t. The average annual quantities of physician and hospital services demanded by each of the insured are given, respectively, by

$$q_{it} = a_4 + a_5 k_t p_t + a_6 y_{it} + a_7 l_t r_t \tag{3}$$

$$z_{it} = b_4 + b_5 k_t p_t + b_6 y_{it} + b_7 l_t r_t \tag{4}$$

where k_t and l_t are the proportions of the respective prices paid by the insured and y_{it} is their per capita income. The demands for each type of service within each population group are interrelated through the prices of both services appearing in each demand equation.

The supply of physician services per physician is given by

$$q_{st} = \gamma_o + \gamma_1 p_t + \gamma_2 t \tag{5}$$

where t is included as a argument to determine the current state of technology. The supply of hospital services per hospital bed is given by

$$z_{st} = \lambda_o + \lambda_1 r_t + \lambda_2 t \tag{6}$$

The national aggregate demand and supply functions are derived from equations (1) to (6) by multiplying each equation by the sizes of the relevant populations and adding the aggregate demand functions of the insured and uninsured populations. The model was estimated using standard econometric techniques. (See Hixson 1979, pp. 85-89.)

Most of the estimated coefficients for the aggregate physician and hospital demand and supply functions have theoretically appropriate signs and are statistically significant at conventional levels. In particular, income has a positive effect on demand of the uninsured for physician and hospital services. Prices have a negative effect on physician and hospital demand by the insured and uninsured populations. Of particular interest is the result that an increase in the price of hospital services reduces the demand for physician services and vice versa. The implication of this relationship is that physician and hospital services are "complementary" goods. On the supply side, output of physician and hospital services are positively related to their respective prices.

PROJECTIONS OF EXOGENOUS VARIABLES

In order to forecast with an econometric model, time paths of the exogenous variables in the model must be projected into future years. The econometric model described above requires projections to 1990 of population, personal income, the number of physicians, the number of hospital beds, and the proportion of the population insured. These five variables can be used in turn to project the number of insured, number of uninsured, income of insured, income of uninsured, and the other exogenous variables used in the four-equation model.

Population projections are published routinely by the U.S. Bureau of the Census. (See U.S. Bureau of the Census 1977.) The proportion which is surgically insured was estimated to be 0.842 in 1975 and 0.829 in 1976.[1] Although the proportion insured fell between 1975 and 1976, the 1970-76 trend represented an annual growth rate of 0.01 in the proportion insured. In any case, the proportion insured reached 0.842 and appears to be leveling off. As shown in Table I, the proportion of population insured is projected to rise slightly above the 1975 level to 0.850 in 1980 and to remain constant through 1990.[2]

The number of physicians in 1975-1990 was obtained from published estimates of active MDs and DOs. These estimates were inflated to total numbers by using the estimated ratio of active to total physicians from 1979 (U.S. Department of Health and Human Services 1980b). The national stock of physicians is estimated to increase 3.1 percent annually, increasing from 409,042 in 1975 to 646,642 in 1990. This compares with an annual increase of 2.7 percent in the 1960-75 period.

The number of hospital beds in the U.S. peaked at 1,703,522 in 1965. During 1965-76, beds decreased to 1,433,515, an average annual decline of 1.6 percent (American Hospital Association 1979). At that rate of change, total hospital beds would number 1,150,846 in 1990. However, such an outcome is unlikely to come to pass because of its implications for certain categories of hospital beds. The category of "short-term general and other specialty hospitals" which contained 961,000 beds in 1976 had grown at an average rate of 2.4 percent during 1965-76. Even if this growth rate fell to zero, total beds outside the "short-term general" category would number less than 200,000 in 1990 compared with 472,515 in 1976. In order to avoid a projection which has such extreme implications, the annual rate of decline in hospital beds was assumed to decline linearly from 1.6 percent in 1976 to zero percent in 1990. With this assumed rate of decline, total hospital beds are projected to become constant at 1,317,083 in 1990.

Although predicting the cyclical performance of the national economy is a rapidly growing industry,[3] forecasts for even a few years into the future are certainly subject to large error. Also, most commercial forecasting firms concentrate their efforts on forecasting short-run business cycle activity. Since the focus of this paper is on long-run forecasts, the short-run business cycle behavior can be ignored in our predictions. An estimate of the long-run growth in personal income was calculated by computing the average annual growth rate during 1973-80. The average was 1.8 percent with a standard error of

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[1] Estimation of the proportion of the population which is surgically insured is discussed in Hixson (1979, p.86).

[2] A recent survey indicated that 87.4 percent of the U.S. population was insured. However, the definition of insured was not identical to that used in the Bureau of Health Professions' econometric model (U.S. Department of Health and Human Services 1980a).

[3] For an interesting look at the use of macroeconomic forecasting services by federal agencies, see U.S. General Accounting Office (1979).

0.9. For the projections in Table I, personal income was assumed to grow at an annual rate of 2.0 percent after 1980 (2.3 percent during 1975-90).[4]

FORECASTS OF PRICES AND EXPENDITURES

The econometric model described above can be used to forecast real (inflation-adjusted) prices and expenditures in the markets for physician and hospital services. Once projections of the independent variables are determined, the four-equation model can be solved for four unknowns: prices and expenditures in both the physicians' services and the hospital services sector. The method used to forecast prices and expenditures abstracts from the actual short-run time path of the health sector variables in order to concentrate on equilibrium values.

Before presenting forecasts from the econometric model, it may be useful to discuss how the projections in Table I affect equilibrium prices and expenditures. Increases in personal income and population during 1975-90 raise the demands for physician and hospital services. Without other offsetting changes, this tends to increase prices and expenditures for both physician and hospital services. However, the stock of physicians is increasing and the stock of hospital beds is declining, which tends to reduce price (and increase expenditures) for physician services and increase price (and reduce expenditures) for hospital services.

Table II presents the long-run forecasts using the projections of exogenous variables from Table I. Each forecasted value is indexed to the base year 1975 to facilitate comparison of changes over the forecast period. The real price of physician services is forecasted to fall by 7.7 percent between 1975 and 1990 while the hospital real price level rises 20.3 percent during the same period. The quantity of physician services rises by 52.8 percent while the quantity of hospital services rises only 34.4 percent. An interesting feature of the model is that a declining price for physician services increases the demand for both physician and hospital services. Similarly, increases in the price of hospital services reduces the demand for both hospital and physician services. These relationships are a result of the fact that physician and hospital services are complementary goods.

Since cost containment is currently an important national policy goal, total and per capita real expenditures on health care services are of particular interest. The model forecasts a 41.0 percent increase in real expenditures on physician services (which is 23.7 percent on a per capita basis) and a 61.7 percent increase in real expenditures on hospital services (which is 41.8 percent on a per capita basis).

A comparison of the forecasts with actual data from recent years provides a quick check of model tracking performance. The model forecasts an annual rate of decline in the real price of physician services of -0.4 during 1975-80. Recent data show that the price index

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[4] This approach to projecting personal income was suggested by Charles S. Roehrig of Policy Analysis, Inc.

Table II—Long-Run Forecasts of Prices and Expenditures for Physician and Hospital Services (1975 = 100.0)

Year	Price	Quantity	Expenditures	Per Capita Expenditures
		Physician Services		
1975	100.0	100.0	100.0	100.0
1980	97.6	117.1	114.3	109.9
1985	94.6	135.1	127.8	117.2
1990	92.3	152.8	141.0	123.7
Annual Rate of Change:				
1975-1980	-0.4	3.2	2.7	1.9
1975-1990	-0.5	2.8	2.3	1.4
		Hospital Services		
1975	100.0	100.0	100.0	100.0
1980	110.3	111.2	122.7	117.9
1985	117.3	122.0	143.1	131.2
1990	120.3	134.4	161.7	141.8
Annual Rate of Change:				
1975-1980	2.0	2.1	4.1	3.3
1975-1990	1.2	2.0	3.2	2.3

for physician services has risen from 169.4 to 240.7 between 1975 and March 1979, while the CPI rose from 191.2 to 214.1. This represents an annual increase in the price of physicians' services (relative to the CPI) of 2.1 percent. A similar comparison with the change in the real price of hospital services between 1975 and March 1979 shows an actual annual rate of change of 4.6 percent compared with the predicted annual growth rate of 2.0 percent during 1975-80. Although the price for physician services is increasing absolutely, it is falling relative to the price of hospital services as predicted by the model.[5]

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[5] Another indicator related to price of physicians services is the net income of physicians. The AMA's Center for Health Services Research and Development (1980, p. 21) reports that average net income from medical practice (in 1978 dollars) fell from $68,366 to $65,500 in 1978, an annual decline of 1.4 percent in real physician income.

The forecasts are accurate with respect to changes in the quantities of physician and hospital services. During 1975-78, physician services rose at an annual rate of 2.4 percent compared with the forecasted 3.2 percent. The increase in hospital services was 1.2 percent compared with the forecasted 2.1 percent annual growth rate.

The model can be used to show how changes in the number of physicians and hospital beds will affect long-run developments in the prices and quantities of physician and hospital services. The comparative statistics of a four-equation, two-market system are somewhat more complicated than that for the single market with two equations. For instance, a decrease in the number of physicians will increase the price of physician services in the single market with no interaction. In the four-equation model, a decrease in the price for physician services decreases the demand for hospital services thus putting downward pressure on the price for hospital services which, in turn, increases the demand for physician services.

Table III shows how changes in the numbers of physicians and hospital beds affect the 1990 equilibrium real prices and quantities. A 10 percent reduction in 1990 stock of physicians (shown as Alternative 1 in Table III) will increase the 1990 real price of physician services to 95.9 compared with the baseline (Table II) forecast of 92.3. The reduction in the 1990 stock of physicians will decrease the real price of hospital services below the forecast in Table II (111.4 compared with 120.3) because a higher price for physician services reduces demand for hospital services. As might be expected, the quantity of physician services declines. However, the quantity of hospital services also shows a decline relative to the baseline forecast. Real expenditures for both physician and hospital services decline relative to the baseline forecasts.

An increase in the number of hospital beds (shown as Alternative 2 in Table III) causes the 1990 real price of hospital services to fall relative to 1975 and relative to the baseline (Table II) forecast. The 1990 real price of physician services increases slightly above that in Table II. Quantities of both physician and hospital services increase relative to the baseline forecasts while real expenditures for hospital services decline relative to the baseline forecast. Real expenditures for physician services increase slightly relative to the baseline forecast.

One must exercise caution in interpreting the results of a time series econometric model based on so few observations. The forecasts and comparative static results presented above should be viewed as only rough indicators of certain forces at work in the health care industry. For instance, since the model includes only one measure of hospital physical capital, beds are probably a proxy for total hospital physical assets. Thus, the model should be interpreted as indicating how changes in hospital capital will affect movements in equilibrium real prices and quantities. Also, the model is too highly aggregated to show how changes in the complicated regulatory environment will affect future outcomes. For example, supply responses to price changes may be prevented by certificate-of-need requirements or other governmental controls.

Table III—Comparison of Alternative Long-Run Forecasts of Prices and Expenditures for Physician and Hospital Services

Alternative	1990 Prices	1990 Quantity	1990 Expenditures
	Physician Services		
0	92.3	152.8	141.0
1	95.9	142.6	136.7
2	93.1	153.7	143.1
	Hospital Services		
0	120.3	134.4	161.7
1	111.4	132.8	148.0
2	96.1	144.9	139.3

0: 1990 Table I values

1: 1990 stock of physicians is 10 percent below 1990 Table I values. (Beds at Table I value)

2: 1990 stock of beds is at 1975 level. (Physicians at Table I value)

The weaknesses of the model notwithstanding, the forecasts indicate some strong forces at work in the health care market place which result from increases in the number of physicians and expansion of controls on hospital investment in physical capital.

SUMMARY AND CONCLUSIONS

Within the past several decades, the Department of Health, Education, and Welfare (now the Department of Health and Human Services) has actively intervened in the markets for health resources. During the period of the 1960's and early 1970's, the thrust of the policy was to increase health manpower and hospital facilities. During the most recent period the policy has changed to one of controlling health care prices and expenditures through regulation.

The forecasts from the model described in this paper reflect the effects of increases in both resources and regulations. As a result of increased medical school enrollments, the stock of physicians will increase through 1990 and beyond. During the recent past and into the foreseeable future, growth in beds and other hospital assets will be controlled by certificate-of-need and other devices. The result will be a decline in the real (adjusted for inflation) price of physician services of 7.7 percent between 1975 and 1990 and an increase in the real price of hospital services of 20.3 percent. Because of these predicted price changes and other factors, the model forecasts an increase in the quantity of physician services of 52.8 percent between 1975 and 1990. Hospital services are forecasted to increase by only 34.4 percent during the same period. However, hospital expenditures (adjusted for inflation) are forecasted to increase by 61.7 percent during 1975-90 compared with an increase of 41.0 percent for physician services during the same period.

At present the Graduate Medical Education National Advisory Committee (GMENAC) is recommending a reduction in enrollments at medical colleges. (See U.S. Department of Health and Human Services 1980c.) The result of such a policy change would be higher prices for physician services than if enrollments were to continue along present trends. On the other hand, the model predicts that a smaller stock of physicians will result in a decline of quantity and real expenditures for physician and hospital services. However, the savings in health care expenditures which result from a smaller stock of physicians must be compared to the detrimental effects of decreases in physician and hospital services.

The projections of the econometric model presented in this paper are consistent with predictions from orthodox microeconomic theory: Increases in the stock of physicians during 1975-1990 will lower the real price for physician services and contribute to the increase in the real price of hospital services.

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Table I—Projections of Exogenous Variables for Forecasting Prices and Expenditures for Physician and Hospital Services 1975-1990

Year	Personal Income (In Billions of 1967 Dollars)	Population (Census Series II)	Hospital Beds (Total AHA)	Physicians (MD & DO)	Proportion of Population Insured
1975 (Actual)	772.95	213,559,000	1,465,828	409,042	0.842
1980	894.45	222,159,000	1,391,553	483,701	0.850
1985	988.53	232,880,000	1,336,989	566,174	0.850
1990	1,092.49	243,513,000	1,317,083	646,642	0.850
Average Annual Percent Change (1975-1990)	2.3	0.9	-0.7	3.1	0.9

Organizational Structure and Medical Practice in Health Maintenance Organizations

*by Fredric D. Wolinsky and Barbara A. Corry**

INTRODUCTION

For more than a decade, Health Maintenance Organizations (HMOs) have been the most widely discussed, analyzed, and hotly debated alternative health care delivery system in the United States. In a recent paper, we concluded that very little can be conclusively stated about the performance of HMOs because of various methodological problems in that literature (Wolinsky 1980). Among the more serious of the problems that we identified was the failure to consider the organizational structure of the HMO in evaluating its performance. Using data from the 1978 HMO Census (OHMO 1979), we found significant differences in performance across the three major types of HMOs. That is, we observed an important relationship between the HMO's performance and its organizational structure in terms of its being a staff, group, or individual practice association (IPA) model HMO (Wolinsky 1980, p. 560). Accordingly, we argued that organizational structure does indeed constrain the performance of HMOs at the macro level.

In the present paper, we expand our previous study by assessing the impact of organizational structure on HMO performance at the micro level. Specifically, we seek to assess the impact of the basic organizational structures of HMOs on individual physicians' practices. Building on our previous work, we examine the practice characteristics of a national sample of HMO physicians to determine whether or not hours practiced, patient load, waiting time, reimbursement patterns, and incomes and expenses significantly differ across the three organizational models. We begin with a brief discussion of the three major types of HMOs.

THE THREE MAJOR TYPES OF HMOs

As a first step in understanding the promise and performance of HMOs at either the macro or the micro level, we must begin with a clear definition of what an HMO is. According to Luft (1980, p. 503), HMOs may best be defined by five essential behavioral characteristics:

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1. The HMO assumes a contractual responsibility to provide or insure the delivery of a stated range of health services.
2. The HMO services an enrolled, defined population.
3. The HMO has a voluntary enrollment of subscribers.
4. The HMO requires a fixed periodic payment to the organization that is independent of use of services. (There may be small charges related to utilization, but these are relatively insignificant.)
5. The HMO assumes at least part of the financial risk and/or gain in the provision of services.

Contractual responsibility means that HMO members have legal rights to medical care provided by the HMO. In a conventional health care system, physicians have the right to decide whether to take on a new patient. In the HMO, however, physicians must provide the care that any HMO member needs. Enrolled, defined population means that the HMO knows to whom it is obligated to provide care and can therefore estimate how much care it will need to provide. This allows HMOs to engage in more accurate planning than conventional health care systems. Voluntary enrollment means that enrollees can choose either a conventional plan like Blue Cross/Blue Shield or the HMO. The choice, however, is theirs to make. Fixed periodic payment means that regardless of the number of services used, a given enrollee pays the same predetermined monthly fee. This means that the HMO does not make more money by providing more services, as is the case in the conventional health care system. Finally, financial risk means that the HMO either financially suffers or benefits from the health care that it delivers.

Basically, there are three types of HMOs, although within each type there is considerable variation. The three types are: staff models, group models, and individual practice associations or IPAs. In a group model HMO, all of the physicians are members of the same group practice. Their medical group contracts with the HMO to provide its services, and is thus a separate legal and fiscal entity from the HMO. Usually, the group services the HMO exclusively, and either owns or contracts with the hospital(s) to which its patients are admitted. Members of the group are reimbursed on a salary or salary-plus-profit-sharing basis. The key element, then, in group model HMOs is that the physicians have a clear proprietary interest in the success or failure of the group, and of the HMO. In essence, they are partners in its financial success or failure. The classic example of group model HMOs is the Kaiser Foundation Health Plan.

Unlike physicians in group models, physicians in staff model HMOs are employed directly by the HMO itself. As a result, they are employees rather than partners. Therefore, they do not have as clear a proprietary interest in the HMO. They are usually reimbursed on a salary basis, although adjustments may be made based on average patient loads. The classic example of a staff model HMO is the Group Health Plan of Puget Sound.

The IPA is a loose federation of independent, individual physicians who agree to treat patients enrolled in a third party's HMO on a fee-for-service basis in their own offices. Frequently, the IPA is jointly sponsored by the local medical societies and insurance companies. When an IPA physician provides services to an HMO enrollee, the physician is reimbursed by the IPA for services rendered, less a modest allowance for the administration of the plan. Unlike staff and group model HMO physicians who usually have the majority of their patients coming from the HMO, IPA physicians usually have no more than 10 percent of their patients coming from the HMO. As a result, while the HMO practice is usually the major, if not the entire, practice for staff and group model physicians, it is a small sideline for physicians in IPAs. The classic example of an IPA is the Forbes Health Maintenance Plan of Pittsburgh.

CONCEPTUAL MODEL

In essence, the three major types of HMOs may be differentiated in terms of two key characteristics. These two characteristics are the organizational constraints embodied in the structure of the HMO itself, and the fiscal incentives which impact on physicians' behavior. Organizational constraints refer principally to the degree that the various health care components in the HMO are structurally integrated into one functional health care system. The more fully integrated the HMO (i.e., the "tighter" the interrelationships between the health care components), the easier it is to implement and supervise standard review processes associated with physicians' treatment requests. Moreover, it is also more likely for such standards and procedures to be uniformly applied and result in substantial cost containment as well as modifications of traditional practice patterns. The fiscal incentives that impact on HMO physicians reflect whether or not they have a clear proprietary interest in the success or failure of the HMO. The greater the proprietary interest of the physician, the more likely he or she is to be conscious of the cost associated with the medical care provided. Physicians with a clear proprietary interest are more likely to adhere to cost-containment strategies and, therefore, may be more likely to alter their medical practices from traditional models.

Table I summarizes our conceptual model as follows. Physicians in IPAs have low levels on both organizational constraints and physician incentives. Therefore, we would expect their medical practices to be most like those of physicians in the traditional fee-for-service health care system. Physicians in staff model HMOs are subject to a low level of physician incentives, combined with a high level of organizational constraints. Thus, we would expect practices of staff model HMO physicians to be somewhat different than those of physicians in either IPAs or the conventional health care delivery system. Finally, group model HMO physicians have high levels of both

Table I—Levels of Organizational Constraints (System Integration) and Physician Incentives (Proprietary Interest) by Type of HMO

HMO Types	Organizational Incentives	Physician Incentives
IPA Model	Low	Low
Staff Model	High	Low
Group Model	High	High

organizational constraints and physician incentives. Thus, their medical practices are most likely to be different than those of physicians in the conventional fee-for-service system. In addition, their medical practices should also be different than those of physicians in either IPA or staff model HMOs.

Unfortunately, variations in individual physicians' practices resulting from differences in the organizational structure of their HMOs has yet to become a popular subject for health services research. Indeed, a review of the literature on HMOs failed to identify a single study on this topic. Accordingly, although our conceptual model is explicitly described above, we do not present any specific hypotheses relating to hours practiced, patient load, waiting time, reimbursement patterns, or incomes and expenses. Thus, the present paper is limited to assessing the conceptual model described above, and to establishing baseline data describing the impact of organizational structure on individual physicians' medical practices in HMOs.

DATA AND METHOD

As indicated above, extant studies of HMO performance have focused on either the HMO or the HMO enrollee as the unit of analysis. As a result, no data base in which the HMO physician was the unit of analysis was available for use. Neither was a list of all physicians associated with HMOs available at the national level. Accordingly, a letter was sent to all HMOs listed in the 1978 census of HMOs compiled by the federal Office of Health Maintenance Organizations (OHMO 1979). The executive directors of each of the 203 HMOs enumerated in the census were asked to provide a list of all physicians participating in their plans. Ninety-seven of the HMOs responded with lists of their participating physicians. In addition, 17 more HMO physician lists were obtained from the Register of Group Practice files concurrently being assembled by the American Medical Association in cooperation with the American Group Practice and Medical Group Management Associations. A comparison of the response rates for the three major types of HMOs failed to indicate any non-response biases. A 20 percent sample was then selected by systematically choosing one out of every five physicians from each HMO physician list, using a new random seed within each HMO. As a result, 3,300 physicians known to be participating in HMOs were selected for study.

The standard AMA Periodic Survey of Physicians questionnaire (described in detail elsewhere in this volume) was then mailed to each of the 3,300 HMO physicians during January 1980. Four follow-up mailings were sent to subsequently nonresponding physicians at approximately one month intervals, resulting in a usable response rate of 50 percent. Responding physicians were classified as participating in staff, group, or IPA model HMOs based on the most recent categorization published by the OHMO in the Federal Register. On all known criteria, which are admittedly few and not specific, the resulting sample of HMO physicians appears to be representative of the population of HMO physicians. However, because there is no conclusive information defining the national population of HMO physicians, this assumption cannot be empirically demonstrated.

Table II presents the resulting distribution of physician respondents by the type of HMO in which they participate. As Table II indicates, 17.9 percent of the 1,642 HMO physicians practice in group model HMOs, 9.9 percent practice in staff model HMOs, and 70.6 percent practice in IPA model HMOs. Five percent of the respondents practiced in HMOs that have not yet been classified in the Federal Register by the OHMO.

Two techniques will be used to determine whether the organizational structure of the HMO is related to the medical practice of individual HMO physicians. First, standard analysis of variance tests will be used to determine whether or not there are significant differences in the practice characteristics based on the HMO's overall organizational structure. Second, Scheffe's (1959) tests will be used to determine which, if any, of the HMO types are different from each other using all possible pairwise comparisons. Using both of these approaches allows us to determine not only whether there are general

Table II—Distribution of Physician Respondents by Type of HMO

HMO Types	Number of Physicians	Percent of Physicians
Group Model	294	17.9
Staff Model	163	9.9
IPA Model	1,160	70.6
Unknown	25	1.5
Total	1,642	100.0

differences across the three types of HMOs, but also precisely between which HMO types the differences are significant.

FINDINGS

Hours Worked and Patient Loads

Table III contains the results of the analysis of variance (ANOVA) for the number of weeks practiced, hours worked, and patients seen by type of HMO. These data show that, on the average, IPA physicians work one more week per year, two to four more hours per week, and provide twelve to nineteen more patient visits per week. In addition, IPA physicians have three to four more hours of direct patient care per week than do staff or group model HMO physicians. Physicians in group model HMOs spend considerably less time, about four or five hours, in the hospital. They also spend less time in business administration activities than do either staff or IPA model HMO physicians.

Although these gross comparisons of the number of weeks worked, hours practiced, and patients seen provide some insight into the general pattern of significant differences between group model, staff model, and IPA model HMO physicians' practices, a different pattern emerges when average lengths of patient visits are calculated from numbers of visits and numbers of hours. These calculations indicate that staff model HMO physicians spend more time per patient with their office patients (23 minutes vs. 21 minutes for group model, and 20 minutes for IPA model HMO physicians), and with their hospital patients (40 minutes vs. 33 minutes for both group model and IPA model HMO physicians). Similarly, staff model HMO physicians provide approximately three more minutes of direct patient care per patient visit than do either group or IPA model HMO physicians.

The longer patient visits provided by staff model HMO physicians may reflect the absence of financial incentives motivating them to provide either: 1) more services in general (i.e., the absence of fee-for-service reimbursement found in both IPA model HMOs and traditional health care delivery systems); or, 2) fewer services per enrollee while seeing more enrollees (i.e., an incentive that may operate in group model HMOs where physicians have a proprietary interest in the plan, and an increase in the number of enrollees results in an increase in plan revenues). That is, because staff model HMO physicians are principally reimbursed on a straight salary, there are no financial incentives impinging upon them to either increase the number of services that they provide or reduce the amount of time they spend with each patient. As a result, staff model HMO physicians appear to be more willing to spend significantly more time with their patients in both the office and hospital settings.

Patient Waiting Times

Table IV contains the average waiting times necessary for new and established patients to schedule an appointment for a routine examination, and to see the doctor on arrival for that scheduled appointment by type of HMO. These data clearly indicate significant differences in waiting time at the general level and for all but one of the specific two group comparisons. Perhaps most obvious are the differences in waiting time for a new patient to schedule a routine office visit. The average waiting time here is slightly more than one week for IPA model HMO physicians, slightly less than two weeks for staff model HMO physicians, and almost three weeks for group model HMO physicians. This indicates that from the new patient's standpoint, access to medical care is the easiest in an IPA model HMO, and the most difficult in a group model HMO.

The gap in waiting time for new patients to schedule a routine office visit, however, is considerably reduced for established patients. Established patients in IPA model HMOs must wait about five days on average compared to approximately six days on average in staff model HMOs and ten days on average in group model HMOs. This may indicate either of two phenomena. First, the considerable reduction in waiting time for established patients to schedule a routine office visit in group and staff model HMOs may reflect concerted efforts to keep patients happy once they have been obtained. This could well be a conscious attempt on the part of closed-panel HMOs to offset the lingering "clinic" atmosphere often described by patients. Second, the considerable decrease in waiting times for established vs. new patients may reflect the fact that patients in IPA model HMOs are far more likely to already have an ongoing patient-practitioner relationship with the physician whom they are visiting, or at least have some prior affiliation or acquaintance, perhaps through friends, with that physician. (See Wolinsky 1980, p. 579.) Accordingly, once the most rudimentary form of a patient-practitioner relationship has been established, waiting time to schedule a routine office visit is considerably reduced. Unfortunately, these data do not provide a clear test between these two explanations. Nonetheless, because of the fact that the proportional reduction in waiting time for established vs. new patients in group and staff HMOs is considerably larger than that found in IPA model HMOs, these data appear to provide more support for the first explanation than for the second.

Although the amount of time patients have to wait to see the doctor after arriving for a scheduled appointment does significantly vary by type of HMO, these differences are relatively small, with the difference between staff model and IPA model HMO physicians being insignificant. In general, a patient waits 18 or 19 minutes to see the physician, with patients seeing group model HMO physicians waiting about two or three minutes less. Accordingly, these data provide some additional support for the first explanation described above. That is, closed-panel HMO physicians may be making more of a conscious effort to reduce waiting time on arrival in order to modify the traditional clinic atmosphere associated with closed-panel HMOs.

Table III—Number of Weeks Practiced, Hours Worked, and Patients Seen by Physicians by Type of HMO, 1980

Variable	Means				ANOVA Significance*			
	Grand	Group	Staff	IPA	Overall	G-S	S-I	G-I
Weeks								
Number of Weeks Practiced in 1979	46.9	46.1	45.9	47.3	.0001	N	Y	Y
Hours								
Total Hours Practiced in a Complete Week	49.7	46.4	48.8	50.6	.0000	Y	N	Y
Direct Care Hours in a Complete Week	44.4	41.1	42.1	45.6	.0000	Y	Y	Y
Office Hours in a Complete Week	27.7	29.5	25.4	27.5	.0062	Y	Y	N
Hospital Hours in a Complete Week	15.8	11.9	16.4	16.7	.0000	Y	N	Y
Business Administration Hours in a Complete Week	4.9	4.3	6.0	4.9	.0245	Y	N	Y
Visits								
Total Patient Visits in a Complete Week	106.4	98.4	91.6	110.7	.0003	Y	Y	Y
Office Visits in a Complete Week	81.2	82.4	67.2	83.0	.0051	Y	Y	N
Hospital Visits in a Complete Week	27.9	20.9	24.5	30.0	.0012	Y	N	Y
Other Visits in a Complete Week	4.9	2.7	4.6	5.5	.1732	Y	N	N

*The columnar entry for overall significance is the precise probability level associated with the one-way analysis of variance test. For the three possible pairwise comparisons of HMO types, a "Y" indicates a significant difference at the .05 probability level or beyond, while an "N" indicates no significant difference for that particular comparison.

Table IV—Patient Waiting Times to Schedule an Appointment With and See a Physician on Arrival By Type of HMO, 1980

	Means				ANOVA Significance*			
	Grand	Group	Staff	IPA	Overall	G-S	S-I	G-I
Waiting Time in Days for a New Patient to be Scheduled for a Routine Office Visit	10.1	19.1	12.3	7.6	.0000	Y	Y	Y
Waiting Time in Days for an Established Patient to be Scheduled for a Routine Office Visit	5.8	10.0	5.7	4.8	.0000	Y	Y	Y
Waiting Time in Minutes to See the Doctor After Arriving for a Scheduled Appointment	18.6	16.1	17.8	19.3	.0026	Y	N	Y

*The columnar entry for overall significance is the precise probability level associated with the one-way analysis of variance test. For the three possible pairwise comparisons of HMO types, a "Y" indicates a significant difference at the .05 probability level or beyond, while an "N" indicates no significant difference for that particular comparison.

Further evidence, however, is needed before this support can move beyond a preliminary level.

Reimbursement Patterns

The percent of patients whose principal health insurance coverage for physicians' services in Medicare, Medicaid, the HMO, other insurance, or no insurance is shown in Table V by type of HMO. Perhaps the most interesting information contained in Table V relates to the percent of patients whose principal health insurance is from prepayment to the HMO. On the one hand, these data show that less than 10 percent of the patients seen by a physician who participates in an IPA model HMO are HMO enrollees. This clearly supports our earlier claim that for IPA physicians the HMO is a sideline to their predominantly fee-for-service private practices. On the other hand, 43.4 percent of the patients seen by physicians participating in staff model HMOs are HMO enrollees, and 67.6 percent of the patients seen by physicians participating in group model HMOs are HMO enrollees. Thus, the plurality of patients seen by physicians in staff model HMOs and the majority of patients seen by physicians in group model HMOs are, in fact, HMO enrollees.

Accordingly, for staff model and especially for group model HMO physicians, the HMO represents their principal medical practice. The same cannot be said for physicians in IPAs. As a result, we would expect staff and group model HMO physicians to be more cognizant of and receptive to their organizations' goals. It should be noted, however, that even physicians in group or staff model HMOs spend, on average, at least one-third of their medical practices treating non-HMO enrollees. Thus, their private practices probably limit the extent to which the HMO's incentive structures may influence their overall practices.

Although the differences in the other reimbursement methods between group, staff, and IPA model HMO physicians are all statistically significant, their absolute differences are relatively small by comparison. The smallest differences are those regarding percent of reimbursement from Medicaid patients, and the greatest differences involve reimbursement from other private insurance carriers. As one would expect, physicians in IPA model HMOs have a higher percentage of patients whose insurance coverage is from private non-HMO sources (49.9 percent) than do physicians in staff model (34.9 percent) or group model (23.0 percent) HMOs. The next largest difference involves Medicare reimbursement, although these differences may merely reflect the fact that IPA model HMO physicians have more fee-for-service patients than do either staff or group model HMO physicians. Because Medicare patients may currently enroll in HMOs only under special demonstration projects authorized by OHMO, they are more likely to be treated by fee-for-service physicians. Finally, IPA model HMO physicians have twice as many uninsured patients as group model HMO physicians and one-third more than do staff model HMO physicians. This reflects the restrictive access barriers that uninsured patients confront in using closed-panel HMO physicians.

Incomes and Expenses

Table VI shows physicians' professional expenses and net incomes by the type of HMO in which they participate. These data show that the actual professional expenses of physicians in 1979 and their estimated 1980 professional expenses vary enormously by type of HMO. Physicians in IPA model HMOs had nearly $57,000 in professional expenses in 1979 compared to less than $41,000 of professional expenses for physicians in staff model HMOs and slightly more than $27,000 of professional expenses for physicians in group model HMOs. Estimated 1980 professional expenses show a similar pattern.

The most plausible explanation for these marked differences in professional expenses is that physicians in IPA model HMOs are responsible for their own professional expenses, although closed-panel HMOs defray varying yet significant portions of their physicians' professional expenses. Specifically, partners in group model HMOs are more likely to have the HMO defray most of their professional expenses, while physicians in staff model HMOs (who are generally salaried employees) receive reimbursement for fewer professional expenses. Thus, these data probably do not indicate that professional expenses per physician are actually lower in closed-panel HMOs when compared to IPA model HMOs. Rather, the data reflect the fact that it is more likely for physicians in closed-panel HMOs, especially those in group models, to be reimbursed for a substantial portion of their professional expenses.

Like the differences in professional expenses, the differences in actual 1979 and estimated 1980 net incomes by HMO type are both large and interesting. These data indicate that IPA model HMO physicians have the highest income levels, earning $80,300 on average, compared to $64,100 on average for staff model HMO physicians, and $65,000 on average for group model HMO physicians. As one would expect, the incomes earned by IPA model HMO physicians are quite comparable to those earned by physicians in the traditional fee-for-service system ($80,800), while the incomes of physicians in group and staff model HMOs are significantly lower. These data are consistent with Fink's (1980) recent report that a major stumbling block in the recruitment of physicians into closed-panel HMOs is the significantly lower salaries which they offer. As our data indicate, the gap between the incomes of physicians in closed-panel HMOs and the incomes of physicians in either IPA model HMOs or the conventional health care delivery system is substantial—on the order of $15,000 to $16,000 annually.

Beyond these obvious differences by type of HMO, when taken together, the data in Tables V and VI suggest an interesting distinction regarding physician incomes in group vs. staff model HMOs. Table V indicates that physicians participating in group model HMOs have two-thirds of their practices involving HMO enrollees compared to about two-fifths of the practices of staff model HMO physicians. Coupled with Fink's (1980) findings that closed-panel HMO physicians are paid less than physicians in fee-for-service practices, one would expect that physicians in staff model HMOs (who have a larger proportion of their practice outside the HMO) would have higher incomes than physicians in group model HMOs. Our data, however, show that this is not the case. Rather, if, in fact, staff model HMO physicians are being reimbursed for their non-HMO practices at rates comparable to those in the fee-for-service system, then they must be receiving a lower reimbursement rate for their HMO practices than do physicians in group model HMOs. Although this interpretation cannot be substantiated from these data, it is consistent with standard economic theory. That is, the greater the risk involved, the greater should be the reward, on average. Because physicians in group practice model HMOs suffer a greater risk as a result of their proprietary interest, it seems plausible for them to be rewarded at a higher level than physicians in staff model HMOs who have no proprietary involvement.

SUMMARY AND CONCLUSIONS

In this paper we have presented and formalized a conceptual model for predicting and explaining differences in the practices of individual physicians participating in staff model, group model, and IPA model HMOs. In essence, we argue that the organizational constraints embodied in the HMO itself as well as the fiscal incentives confronting physicians would impact on physicians' behavior. Specifically, we posit that greater degrees of structural integration in the HMO (i.e., the organizational constraints) and more clear proprietary interests in the success or failure of the HMO (i.e., the fiscal incentives) would, indeed, effectively constrain the practices of individual HMO physicians. We expect that the practices of physicians participating in group model HMOs would be the most constrained from traditional fee-for-service medical practices because group model HMO physicians have high levels on both the organizational constraints and fiscal incentives. Physicians participating in IPA model HMOs, however, have low levels on both the organizational constraints and fiscal incentives; therefore, we expect their practices to be relatively unconstrained. Finally, because physicians participating in staff model HMOs have high levels on the organizational constraints but low levels of fiscal incentives, we expect their practices would be only moderately constrained by the organizational structure of the HMO.

Using data from a 1980 stratified random sample of 1,642 physicians known to be working in HMOs, we tested the conceptual model with respect to various practice characteristics, including: hours practiced, patient load, waiting times, reimbursement patterns, and incomes and expenses. The results show that the organizational structure of an HMO does, indeed, constrain the individual physician's practice. Moreover, the patterns that emerged in the analysis conform rather well to both the conceptual model described above and the assumptions generally made in the HMO performance literature regarding medical practice in HMOs. Thus, although these data represent only the initial report from our ongoing study of the performance of HMOs at both the macro and the micro levels, they do provide rather compelling support for our general conceptual model. This reaffirms the importance of considering organizational structure when evaluating HMO performance. Subsequent papers will focus more directly on the deduction and testing of specific hypotheses, as well as on the distillation of practice profiles for physicians in staff model, group model, and IPA model HMOs.

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The Economic Status of Resident Physicians: Results from the Survey of Resident Physicians

*by Douglas E. Hough**

INTRODUCTION

The adverse conditions under which resident physicians labor have long been a part of medical mythology: low salary, long working hours, frequent on-call duty, out-of-title work, and little collegiality with hospital medical staff. However, there is a growing perception that these conditions have eased considerably, so that resident physicians today no longer suffer economic deprivation as they complete their formal education. This paper will investigate the validity of this perception by examining the results of the "Survey of Resident Physicians," an economic survey of residents conducted in 1979 by the Center for Health Services Research and Development of the American Medical Association. The results of this survey will indicate that although residents currently receive what could be termed a "reasonable" salary, their long work week transforms this salary into an implicit wage rate of between $3 and $5 an hour. In addition, the survey's findings will reflect on these residents' expressed dissatisfaction with other elements of their programs. In this regard, it is shown that young physicians still are not able to view residency training itself as a financially rewarding experience, even though the future returns to their education may still be substantial.

A BRIEF LOOK BACKWARD

To gain a perspective on the current economic status of resident physicians, it is useful to understand how far salaries have risen. Robert Harmon (1978), in a major history of the development of resident organizations, detailed some of the early gains. In 1935, the Interne Council of Greater New York fulfilled a major goal when it negotiated with the New York Board of Estimate to increase interns' salaries from zero to $15.00 per month.[1] Harmon found that by 1948 interns in the United States were earning an average monthly salary of $60. Interns in New York City municipal hospitals attained $71 per month by 1957, with residents averaging $105. Finally, Harmon reported that residents' organizing activity had increased annual salaries at Boston City Hospital in 1967 to $6,600 for interns and $10,000 for

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[1] Until 1975, internships were formally separate programs from residencies. However, for the purposes of this paper, they will be considered merely as the first year of graduate medical training.

Table V—Percentages of Patients Whose Principal Health Insurance Coverage for Physicians' Services is Medicare, Medicaid, the HMO, Other Insurance, or No Insurance By Type of HMO, 1980

	Means				ANOVA Significance*			
Variable	Grand	Group	Staff	IPA	Overall	G-S	S-I	G-I
Medicare	20.8%	13.1%	19.7%	22.4%	.0000	Y	N	Y
Medicaid	9.2	7.6	11.0	9.3	.0301	Y	N	Y
Prepayment or the HMO	23.7	67.6	43.4	9.6	.0000	Y	Y	Y
Other Insurance	45.0	23.0	34.9	49.9	.0000	Y	Y	Y
No Insurance	9.5	5.0	7.6	10.5	.0000	Y	N	Y

*The columnar entry for overall significance is the precise probability level associated with the one-way analysis of variance test. For the three possible pairwise comparisons of HMO types, a "Y" indicates a significant difference at the .05 probability level or beyond, while an "N" indicates no significant difference for that particular comparison.

Table VI—Physicians' Professional Expenses and Net Incomes by Type of HMO

	Means				ANOVA Significance*			
Variable	Grand	Group	Staff	IPA	Overall	G-S	S-I	G-I
1979 Professional Expenses (in thousands)	51.0	27.3	40.6	56.9	.0000	Y	Y	Y
Estimated 1980 Professional Expenses (in thousands)	57.1	32.0	47.3	62.8	.0000	Y	N	Y
1979 Net Income (in thousands)	75.8	65.0	64.1	80.3	.0000	Y	Y	Y
Estimated 1980 Net Income (in thousands)	81.5	71.4	71.2	85.6	.0000	Y	Y	Y

*The columnar entry for overall significance is the precise probability level associated with the one-way analysis of variance test. For the three possible pairwise comparisons of HMO types, a "Y" indicates a significant difference at the .05 probability level or beyond, while an "N" indicates no significant difference for that particular comparison.

residents. Assuming that these examples are representative of a general trend, it is apparent that interns and residents enjoyed a rapid rise in their remuneration from the 1930s to 1960s.

Two other sources confirm this trend for the 1970s as well. Periodic surveys of interns and residents conducted by *Hospital Physician* (Agresta 1973; Caffaro 1978) found that median salaries for interns rose from $3,810 in 1965-66 to $8,500 in 1970-71, $9,590 in 1972-73, and $12,300 in 1976-77, representing over a three-fold increase in eleven years. Median salaries for residents during the same period grew from $4,870 to $9,600, $11,060, and $13,500, respectively, somewhat less than a three-fold increase. Although these advances are impressive, they must be tempered by the realization that most of these gains occurred before 1970, when median incomes for these physicians grew by 14 to 17 percent per year, rather than after 1970, when annual increments were on the order of 5 to 7 percent.

This pattern also is evident from the results of annual surveys of member institutions undertaken since 1968 by the Council of Teaching Hospitals (COTH). In 1978, COTH reported mean salaries for interns (or, after 1975, first-year residents) of $6,200 in 1968-69, $8,115 in 1970-71, $9,698 in 1972-73, and $12,371 in 1976-77.[2] The Council reported resident salaries by year of graduate training, rather than as a whole. Thus, mean salaries of second-year residents grew from $6,800 in 1968-69, to $8,759 in 1970-71, $10,398 in 1972-73, and $13,279 in 1976-77. Similarly, mean fourth-year resident salaries increased from $7,800 in 1968-69, to $9,824 in 1970-71, $11,592 in 1972-73 and $14,853 in 1976-77. Again, salary levels grew rapidly until the early 1970s, after which time annual salary increments fell to between 5 and 7 percent. In fact, the COTH data indicate that residents' *real* income peaked in 1972-73, and fell by over six percent between that time and 1977-78.

Jensen (1979) identified three reasons for the initial surge in salary increases. First, demand for health care in the U.S. during the 1960s expanded rapidly, resulting from both a significant rise in real personal income and the advent of Medicare and Medicaid. Consequently, these events triggered a rise in demand for all inputs into medical care, including resident physicians. Second, Medicare and Medicaid magnified this increase in demand for residents by shifting the pattern of health expenditures in favor of hospitals. Third, these developments precipitated a rise in organizations of resident physicians aimed in part at alleviating onerous working conditions and low salaries. For the most part, these factors were overshadowed in the 1970s by the change in emphasis in health care from access to cost containment and the institutionalization of many resident-hospital negotiations. Thus, the economic gains by resident physicians have been much more modest in the past decade.

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[2] Note that this survey reported *mean* salaries, rather than *median* salaries as presented earlier.

THE CURRENT FINANCIAL STATUS OF RESIDENT PHYSICIANS

With these studies as background, the economic status of resident physicians as of the 1978-1979 academic year can be considered. The data reported here come from a survey of resident physicians conducted in the spring of 1979 by the Center for Health Services Research and Development. The survey contained questions on resident status, income, fringe benefits, hours and kinds of work, problems with the residency program, and success of resident organizations in improving conditions. Mailed questionnaires were sent to a one-sixth random sample (n = 9,755) of resident physicians; of these, 3,403 (35 percent) returned usable questionnaires.

Table I shows the first economic component of this survey—median annual salary. Taken as a whole, resident physicians in 1978-79 earned a median income of $15,000. As expected, salaries varied by year of training and region. First-year residents (formerly, "interns") received a median income of $13,900. More experienced residents earned more; for example, residents with five or more years of graduate training earned a median of $17,000. Residents in the Northeast and West regions earned the most ($16,000), followed by resident physicians in the North Central region ($14,900) and the South ($14,000). The effects of region and year of training acted to reinforce one another. First-year resident physicians in the South received a median income of $12,900, whereas residents in the Northeast or West with five or more years of graduate training received $18,000.

Table I—Median Annual Salary of Resident Physicians by Region and Year of Training, 1979

Year of Graduate Medical Training	Region				
	Northeast	North Central	South	West	U. S.
1	$14,500	$14,000	$12,900	$13,800	$13,900
2	15,564	14,500	13,400	15,000	14,600
3	16,150	15,075	14,200	16,000	15,275
4	17,800	16,000	15,000	17,000	16,200
5+	18,000	16,290	16,000	18,000	17,000
Total	$16,000	$14,900	$14,000	$16,000	$15,000

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

Interesting contrasts emerge if median annual salary is broken down by year of graduate training and type of hospital (non-federal government, private not-for-profit, and federal government). Table II displays these breakdowns. Resident physicians in not-for-profit hospitals earned the median income of all residents ($15,000). Those in non-federal government hospitals earned slightly less ($14,300). The largest differential from the median occurred with those residents in federal government hospitals (mostly Veterans Administration and military hospitals). These physicians earned a median salary of $20,000 in 1978-79. Curiously enough, this median also applied to those residents in their second, third, and fourth year of graduate training at federal institutions, implying that differential experience may not be rewarded in these hospitals. This pattern did not occur with the other two major types of hospitals, the annual increments at these institutions being small but perceptible.

Table II—Median Annual Salary of Resident Physicians by Type of Hospital and Year of Training, 1979

Year of Graduate Medical Training	Type of Hospital			
	Non-federal Government	Not-For-Profit	Federal Government	Total
1	$13,100	$14,000	$18,000	$13,900
2	14,000	15,000	20,000	14,600
3	14,600	15,900	20,000	15,275
4	15,500	16,800	20,000	16,200
5+	16,500	17,200	21,900	17,000
Total	$14,300	$15,000	$20,000	$15,000

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

The salary figures presented in these tables appear consistent with the earlier income trends reported by both Hospital Physician and COTH. In addition, the latest COTH report (COTH 1978) finds comparable results for mean salaries of residents in 1978-79: $13,904 for first-year residents, $14,896 for second-year residents, $15,754 for third-year residents, and $16,646 for fourth-year residents.[3] These sources plus the AMA survey data suggest that resident incomes recently have been increasing at an annual rate of 6 percent, considerably less than the rise in the Consumer Price Index. That is, resident physicians' incomes have been unable to keep pace with inflation.

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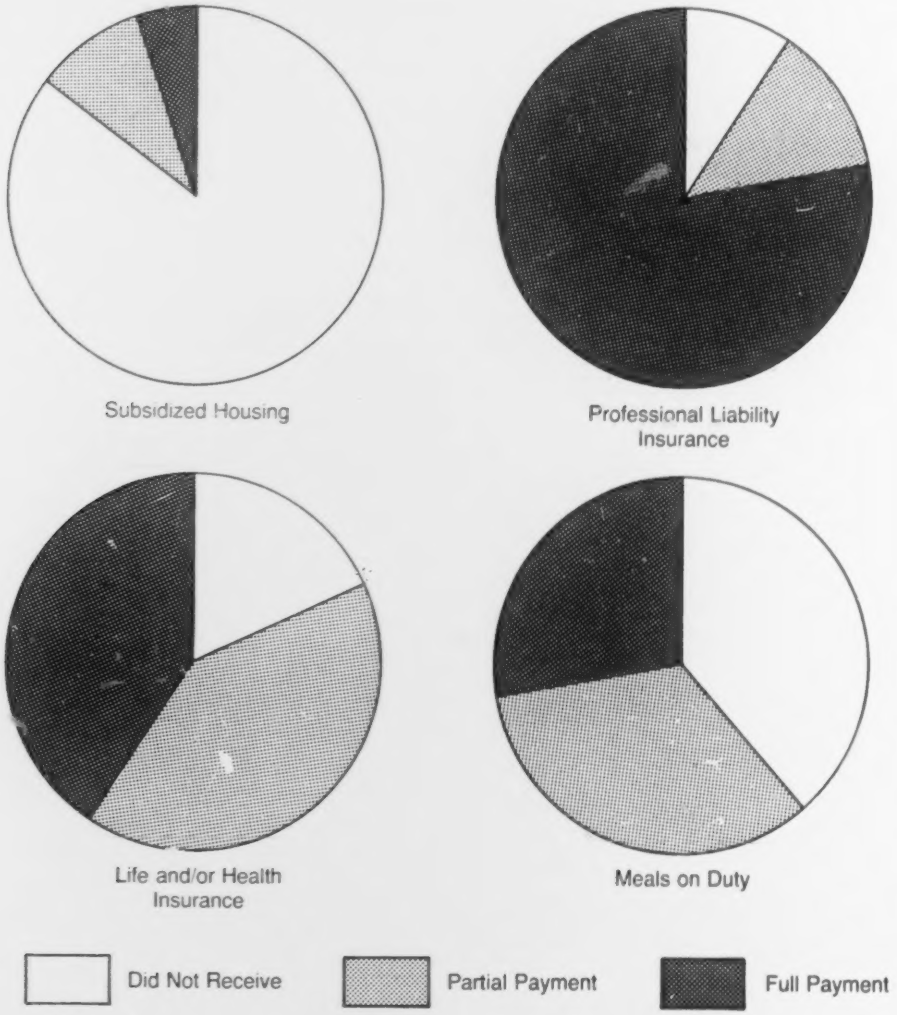
[3] Mean salary should exceed median salary, as shown here, because of the asymmetric income distribution caused by a small number of resident physicians earning very large incomes.

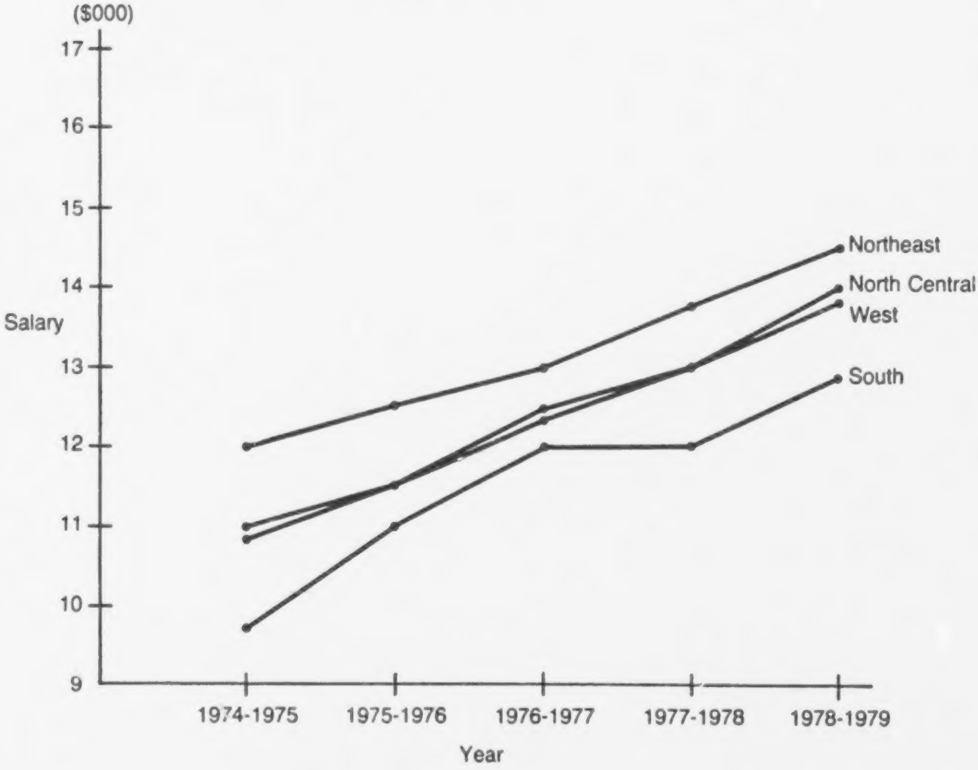
Resident physicians, of course, receive remuneration beyond that of monetary income. Figure 1 shows the extent of fringe benefits received by those residents who responded to the AMA survey. Subsidized housing apparently was not one of those benefits, as 85 percent of residents reported the absence of this perquisite. Professional liability insurance was a major benefit, with 78 percent of the residents receiving full payment. This full coverage, however, was not provided for life or health insurance; only 43 percent received full coverage, with another 43 percent obtaining at least partial payment. Finally, there was considerable disparity over the provision of free meals on duty: 42 percent of residents had to pay the full cost of their meals, 32 percent had their meals partially subsidized, and only 26 percent received meals at no cost. In total, then, resident physicians have received some form of nonmonetary compensation, but the extent of these fringe benefits has varied significantly.

Figure 1—Fringe Benefits Received by Medical Residents, 1979



A final indicator of the financial status of resident physicians is presented in Figure 2. Residents of all years were surveyed regarding their salary in the first year of graduate training; this information permitted the construction of a time series for first-year resident income since the 1974-75 academic year. Several facts can be gleaned from this figure, other than that of the obvious monotonic increase in median salary. First, regional differences in first-year incomes have decreased over time, both in absolute and relative terms. In 1974-75, first-year residents in the South earned, on average, 19 percent (or $2,275) less than first-year residents in the Northeast; by 1978-79, this differential had decreased to 11 percent ($1,600). Second, these data confirm the recent slow growth in resident salaries: median first-year residents income grew nationally at an annualized rate of only 6.5 percent, salaries in the South rising by 7.3 percent a year and those in the Northeast increasing by only 4.8 percent annually. Third, these data are remarkably similar to the salary trends reported above and elsewhere by Hospital Physician and COTH. This concordance between the results of surveys with distinctly different methodologies confirms the information presented here regarding the financial status of resident physicians. It also supports the reliability of the working conditions and other results reported below.

Figure 2—Median Estimated First-Year Salary of Resident Physicians by Region, 1974-1979



WORKING CONDITIONS OF RESIDENT PHYSICIANS

Salary and fringe benefits represent only one dimension of a job, so it is therefore not entirely appropriate to use these factors alone as evidence of resident physicians' rising economic status. Rather, they must be qualified with an appreciation of the working conditions these physicians must face. The first of these conditions to be considered is the length and division of activities of a typical work week for residents. The length of a resident's work week has often been used as the principal measure of the "ordeal" a resident must endure to become a physician; anecdotal evidence exists of 112-hour work weeks, work "days" of 36 hours or more, and five-day continuous on-call periods.

Table III examines the validity of these impressions for all residents. The average resident physician spent 71.4 hours in a typical week in 1978-79 working and learning in his or her program. This work week was broken down into the following tasks: 56.0 hours (79%) in providing direct patient care, 8.5 hours (12%) in receiving formal instruction, 3.4 hours (5%) in performing administrative duties, and 3.2 hours (4%) engaged in other responsibilities (teaching, research, "scut-work," etc.).[4] Thus, the residency program is very much a "learning by doing" experience, with little formal instruction per se. This emphasis

Table III—Mean Distribution of Resident Physician Weekly Working Hours by Year of Training, 1979

Year of Graduate Medical Training	Weekly Hours in:				Total[a] Weekly Hours
	Patient Care	Receiving Instruction	Administration	Other	
1	66.9	9.3	3.5	2.4	82.2
2	57.8	8.8	2.9	2.8	72.4
3	50.8	8.4	3.1	3.4	65.8
4	48.2	7.8	4.0	4.7	65.2
5+	56.0	7.4	3.9	3.3	71.0
Total	56.0	8.5	3.4	3.2	71.4

[a] Total hours may not equal the sum of the component hours because of rounding or sampling errors.

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

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[4] The sum of the component hours does not equal total hours because of rounding and sampling errors.

may militate in favor of the argument that a medical residency is more comparable to on-the-job training than to formal education, and thus, residents are more like employees than students.

This interpretation plus the "rite of passage" concept of residencies are corroborated in part by the length and distribution of hours by year of graduate training. First-year residents worked the longest (an average of 82.2 hours per week), with the work week declining for each subsequent year of training except the last.[5] First-year residents also received the largest amount of formal instruction (an average of 9.3 hours per week), but the difference between first-year and fifth-year residents was only about two hours a week. One surprising result from Table III is that only nine percent of a typical resident's work week was not spent in either direct patient care or formal instruction. In addition, the amount of resident time devoted to administration or other duties did not vary significantly by year of training, suggesting that the often-heard resident complaint about "scutwork" or "out-of-title" work may not have been widespread in 1978-79. Thus, the concern about the physical toll imposed by residency programs may arise more from the number of hours resident physicians must work than from the distribution of those hours among various tasks.

Of course, problems with residency programs can come from a variety of sources. Table IV enumerates how the residents responding to the AMA survey perceived eight potential problems in their programs. Two problems stood out as being of major concern to these residents: insufficient resident participation in planning curriculum (mentioned by 24.6 percent of the residents) and lack of support personnel (mentioned by 23.3 percent). Insufficient participation in planning was also seen as the primary "minor problem" by residents, mentioned by 41.5 percent of those responding; inadequate salary was the second most frequently mentioned minor problem (by 36.8 percent). Finally, about half of the resident physicians perceived no problem with excessive emphasis on medical service (55.8%), lack of facilities (52.3%), or inadequate fringe benefits (50.8%).

In total, the residents in the AMA survey have given some curious responses to questions about their working conditions. Their work week was long, but they did not seem to be burdened with "unnecessary" tasks. As to other possible hardships, seven of the eight potential problems asked about in the survey were not of concern to at least forty percent of those responding. In addition, the problems most frequently mentioned involved quality of care or educational issues; that is, resident physicians seemed more concerned with being able to do their jobs adequately and with enhancing the learning aspects of their residencies than with obtaining more remuneration or reducing their work load. This apparent attitude is especially surprising when one considers the implicit wage rates that these residents are being paid.

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[5] The rise in work week length for residents in their fifth or later years of graduate training may be explained by the fact that these residents are typically involved in subspecialty training, which requires greater intensity of effort.

IMPLICIT WAGE RATES FOR RESIDENT PHYSICIANS

The final element in assessing the current economic status of resident physicians involves the implicit (or effective) hourly wage rates they receive. Table V breaks down these implicit wage rates by region and year of graduate medical training. It demonstrates that although the median resident physician in the United States earned $15,000 a year in 1978-79, the length of the work year created an implicit hourly wage of only $4.38. Not unexpectedly, this median wage rate varied by region: $4.62 an hour in the Northeast, $4.56 an hour in the West, $4.35 an hour in the North Central region, and only $4.08 an hour in the South. It also is not surprising that this implicit wage rate varied greatly by year of training, from only $3.35 for the median first-year resident to $5.23 for the median fourth-year resident. Again, as with the salary figures cited earlier, region and year of training reinforce each other: the median first-year resident physician in the South implicitly received only $3.07 per hour of work in 1978-79, whereas the median fourth-year resident in the West earned $5.71.

Table V—Median Implicit Hourly Wage Rate of Resident Physicians by Region and Year of Training, 1979

Year of Graduate Medical Training	Region				
	Northeast	North Central	South	West	U. S.
1	$3.53	$3.30	$3.07	$3.44	$3.35
2	4.43	4.11	3.63	4.30	4.13
3	5.21	5.41	4.60	5.01	5.10
4	5.06	5.22	5.07	5.71	5.23
5+	4.95	4.97	4.33	5.23	4.88
Total	$4.62	$4.35	$4.08	$4.56	$4.38

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

The paucity of these implicit wages can be brought into dramatic focus when compared with the then prevailing federally legislated minimum wage of $2.90 an hour. The data supplied by the resident physicians in the AMA survey imply that 29 percent of the first-year residents in 1978-79 earned less than the minimum wage. This percentage dropped off rapidly after the first year, but even so, about 12 percent of all residents received less than the equivalent of the minimum wage. The percentage of resident physicans with implicit wages below the minimum wage also varied significantly by region: 8 percent in the Northeast, 10 percent in the North Central and Western regions, and 18 percent in the South. Even more striking may be the fact that 41 percent of first-year residents in the South earned less than the minimum wage in 1978-79. Put differently, these data indicate that a substantial fraction of a set of full-time workers with fifteen or more years of education were unable to earn the equivalent of the minimum wage in 1978-79.

Significant differences in these implicit wage rates can also be discerned by type of hospital, as indicated in Table VI. Following the salary differentials described earlier, resident physicians in federal government hospitals earned substantially more per hour in 1978-79 than those in other institutions (a median of $5.95 an hour versus $4.34 an hour for those in private, not-for-profit hospitals and $4.22 for those in state, county, or city government hospitals). This differential was significant enough that the median first-year resident in federal facilities received a higher wage than the median for all residents in either not-for-profit or non-federal government hospitals. The divergence in implicit wage rates with respect to type of hospital also extended to the proportion of residents falling below the prevailing minimum wage in 1978-79: 14 percent of resident physicians in non-federal government institutions, 12 percent of those in not-for-profit hospitals, but only 2 percent of residents in federal government hospitals. Even more telling, the proportions for first-year resident physicians only were 34 percent, 29 percent, and 2 percent, respectively. Thus, resident physicians in Veterans Administration, military, or other federal hospitals did not share the same economic burden as

Table VI—Median Implicit Hourly Wage Rate of Resident Physicians by Type of Hospital and Year of Training, 1979

Year of Graduate Medical Training	Type of Hospital Non-federal Government	 Not-For-Profit	 Federal Government	Total
1	$3.31	$3.27	$4.36	$3.35
2	3.86	4.13	6.42	4.13
3	4.89	5.10	6.38	5.10
4	4.79	5.41	6.90	5.23
5+	4.93	4.70	7.26	4.88
Total	$4.22	$4.34	$5.95	$4.38

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

those residents in other hospitals. Nevertheless, even a median wage of less than $6 per hour cannot be considered a munificent wage rate for such highly educated personnel.

CONCLUSION

The data presented in this paper yield ambiguous evidence regarding the current economic status of resident physicians. Salaries for these physicians have grown rapidly in the past two decades, so that the median resident in 1978-79 received about $15,000. This development has been tempered, however, by the fact that most of this growth occurred in the 1960s, with recent increases often being below the rise in consumer prices. Thus, resident physicians may be finding themselves in the same situation as other workers in the United States—their earnings are rising, but not fast enough. To this circumstance must also be added the fact that these residents work very long hours (an average of 71 hours a week) with much of that time (often over 75 percent) devoted to direct patient care. When this element is taken into account, the implicit wage rate that resident physicians receive is often quite low, so that one resident in eight in 1978-79 effectively earned less per hour than the equivalent of the minimum wage.

Why have these highly educated, "underpaid" workers not rebelled against these conditions? In some sense they have, as demonstrated by the development of resident organizations (Harmon 1978). In part the rise in resident salaries and the alleviation of some of the more onerous aspects of graduate medical training can be attributed to these associations. In spite of these efforts, implicit wage rates remain low. Yet, when asked, the residents in the AMA survey cited patient care and educational issues as problems of highest concern rather than salary, on-call problems, or lack of due process. This attitude reflects the dual nature of medical residency: resident physicians are students as well as workers, and as such they seem willing to endure substantial financial hardship in order to complete their formal medical training.

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Table IV—Residency Problems as Perceived by Resident Physicians, 1979

	Extent of Problems			
Type of Problem	Major Problem	Minor Problem	Not a Problem	Cannot Assess
Too much emphasis on medical service	12.0%	28.9%	55.8%	3.3%
Excessive on-call duty	16.9	34.0	48.9	0.2
Insufficient resident participation in planning curriculum	24.6	41.5	31.7	2.2
Inadequate salary	15.0	36.8	47.8	0.4
Inadequate fringe benefits	14.7	33.9	50.8	0.7
Lack of facilities	14.3	32.9	52.3	0.5
Lack of support personnel	23.3	32.6	43.4	0.7
Inadequate due process and grievance mechanism	17.5	32.4	41.8	8.3

Source: Survey of Resident Physicians. May 1979. Center for Health Services Research and Development, American Medical Association.

The American Medical Association's Periodic Survey of Physicians *by Louis J. Goodman and Lynn E. Jensen**

INTRODUCTION

The American Medical Association (AMA) has conducted annual economic surveys of physician work patterns and practice characteristics since 1966. This survey series, known as the Periodic Survey of Physicians (PSP), provides the AMA Center for Health Services Research and Development and others with an analytical data base on office-based medical practice in the U.S.

This paper describes the PSP and assesses progress and problems of the survey over the past decade. Particular attention is devoted to response/non-response studies and survey experiments that have been conducted by the AMA Center for Health Services Research and Development. The discussion concludes with an examination of future directions for the PSP and its role in health services research.

The Periodic Survey of Physicians and AMA's Data Base

The major component of AMA's data base is the AMA Physician Masterfile. This file contains current and historical information on every known physician in the United States, including nonmembers of the AMA, American medical graduates practicing abroad, and foreign medical graduates (FMGs) practicing in this country. This well-defined population allows the Association to select subpopulations for additional data collection and analysis. The PSP sample is selected from one such subpopulation of physicians. Other subpopulations include group practice physicians, foreign medical graduates, women physicians, and medical school alumni, to name a few.

A computerized data entry system updates information on each physician continuously to maintain the validity and completeness of information on both the Masterfile and sample surveys. Approximately 3,000 record updates—triggered by AMA mailings; physician correspondence; and communications with other organizations such as hospitals, government agencies, specialty boards, and licensing agencies—are processed weekly. In addition, each physician's record is updated throughout his career by a triennial census survey.

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The quality of Masterfile data is essential to the selection of the PSP sample and subsequent analysis of PSP data. Accordingly, the AMA monitors the inclusion of all variables in the Masterfile, maintains an ongoing quality control program for data updates, and undertakes activities to certify the validity and reliability of the data contained in the file.

Quality of Physician Masterfile Data

Since the quality of certain data elements on the research files constructed from the PSP series depends on the quality of the Masterfile itself, some elaboration is indicated. The quality of Masterfile data has been subjected to several examinations by organizations independent of the AMA. The quality of Masterfile data was recently compared to data bases for other professionals (Yett 1978).

Over the past decade, five separate studies examined the reliability of AMA Physician Masterfile data and found these data to be highly consistent with comparison data samples. All studies (summarized in Goodman and Eisenberg 1977) indicate physician location is accurate within a range of 2.1% to 6.6%. As expected, the most changeable characteristic is the physician's professional activity.

Quality of data on the Masterfile is important for the PSP series for two reasons. First, the Masterfile provides the universe from which the sample is selected. Second, specific data elements from the Masterfile are merged with PSP questionnaire data.

THE PERIODIC SURVEY OF PHYSICIANS

Theodore and Sutter (1966) designed the first PSP to gather information yearly on the practice of medicine:

> The purpose of the first Periodic Survey of Physicians was fourfold: (1) to compare data from the AMA records against specialty and activity information obtained from physicians in the sample; (2) to arrive at a descriptive profile of the physician population in terms of basic characteristics available from both of these sources; (3) to obtain estimates on the utilization of physician services in terms of weeks worked per year, number of hours practiced per week, and number of patient visits; and (4) to test the feasibility of obtaining such data through surveys conducted by the Association.

Survey Design and Methodology

Since its inception, the PSP has been based on a probability sample of physicians selected from the AMA Physician Masterfile. Although sample designs have varied somewhat over the years to correspond with specific research objectives, the annual survey has always included a representative sample of office-based physicians engaged in active medical practice in the United States.

Currently, the PSP sample is based on a stratified systematic probability sample of approximately five percent of the entire U.S. nonfederal office-based physician population. Specialty representation in the sample is proportional to the size of the specialty category in the PSP physician population. Determination of the PSP sample size, usually around 10,000 physicians, is based primarily on the expected rate of response and the desired precision for the population estimates.

The PSP survey instrument is a mailed, self-administered, four-page questionnaire. (See Appendix to this volume.) A cover letter from the Executive Vice President of the AMA is printed on the first page of the instrument. The letter explains the purpose of the survey, assures confidentiality of response information, and requests the individual physician's participation. The remaining three pages of the questionnaire are devoted to closed-ended, precoded questions. The physician's name and address are computer-printed on a portion of the last page of the questionnaire which may be removed by the respondent to assure confidentiality during the processing of his questionnaire. The questionnaire and a prepaid business reply envelope are sent by first-class mail, a procedure associated with higher response rates among physicians (Gullen and Garrison 1973; Goodman 1975).

Efforts to maintain the confidentiality of physician data include: a) elimination of physician's name and address from all documents and data files containing response data, b) creation of a computer-generated physician identification code meaningful only for file linkage purposes, and c) destruction of data files which facilitate linkage upon completion of data processing.

The PSP questionnaire is designed to include a core section which is subject to only minor revisions from year to year and a variable research section which is modified substantially from one annual survey to another. The core section includes questions on physician's practice characteristics, work patterns (hours worked, patient visits) and finances (fees, incomes, and professional expenses). The research section is designed to meet specific objectives in the research program of the AMA Center for Health Services Research and Development. In the recent past the research section has dealt with such topics as provider reimbursement and the impact of technological innovation on medical practice. New questions as well as modifications to existing questions are subject to review and approval by a standing committee of the Research Center.

PSP Pilot Survey

A pilot test of the survey questionnaire is conducted prior to each annual survey. The primary objective of the pilot survey is to evaluate new or modified questions for clarity, readability, and rate of response. The pilot survey is conducted precisely according to the same procedures as those used for the annual survey, except on a smaller scale.

Pilot questionnaires are mailed to a representative random sample of approximately 500 physicians drawn from the PSP population. Responses to the pilot test are edited, coded, and tabulated; and the results are reviewed to determine the necessity for questionnaire revisions.

Modifications to the instrument are made as needed on the basis of write-in comments and responses that are inconsistent with comparable information or a priori expectations. Pilot results are of substantial use in the wording of unambiguous questions to elicit valid responses (Sudman 1976; Oppenheim 1966).

Quality Control of PSP Data

Selection of a statistically designed representative probability sample of physicians initiates the data collection process. A computerized response log is maintained on each physician in the sample. This log includes:

- physician identification code
- date of initial mailing
- dates of follow-up mailings
- response code
- date of response

The computerized log is updated with appropriate information upon receipt of the returned questionnaire. Follow-up mailings to all nonresidents are conducted at approximately monthly intervals. As many as five follow-up mailings may be conducted during the course of the survey. Manual and machine editing of returned questionnaires is based on a set of standard procedures described by Henderson (1978).

Steps to prevent disclosure of sensitive information are also extended to the analytical and reporting phases of the survey. For example, tabular information is presented only at major levels of aggregation (i.e., census division, major specialty category). In addition, security is maintained to protect the data file from either inadvertent or unauthorized disclosure.

Uses of the PSP

The current PSP represents the efforts of over a decade of experience. Since the first PSP was conducted in 1966, data collected with this instrument continue to have varied uses.

First, data from the series are published regularly. The annual Profile of Medical Practice contains basic data on medical practice and research reports based on PSP data. PSP information displayed in this volume indicate changes have occurred over time with respect to the economics of medical practice. Second, PSP supports major AMA research activities. Finally, PSP data are used for public policy analyses.

PSP SURVEY RESPONSE RATES

In recent years, survey response rates to the PSP have declined and do not increase appreciably after the first follow-up attempt. Various organizations, both public and private (e.g., Health Care Financing Administration and California Medical Association), have extensively surveyed social and economic aspects regarding the delivery of physician services. These organizations have found that medical economic data are very difficult to collect. During 1974 AMA also became concerned that response rates to the PSP were beginning to fall below the high levels previously obtained.

Table I summarizes AMA's experience with response rates for this survey. As indicated, rates have dropped from 80% in 1966 to the current 50% level. Experience shows that after the initial mailing, each successive call-back obtains increasingly fewer returns.

Table I—AMA Periodic Survey of Physicians: Sample Size, Response Rate, and Number of Mailings

PSP No.	Survey Year	Sample Size	Percent Response	Number of Mailings
1	1966	3,544	79.9	4
2	1967	5,265	70.4	5
3	1968	5,885	70.1	6
4	1969	5,052	68.3	4
5	1970	7,563	62.0	4
6	1971	7,842	64.0	4
7	1972	9,160	55.5	6
8	1973	7,500	55.9	5
9	1974	10,169	48.7	4
10	1975	10,295	51.4	5
11	1976	10,655	50.0	5
12	1977	10,000	48.7	6
13	1978	10,000	50.8	6
14	1979	11,494	50.3	6

Decline in survey response rates, in general, can be attributed to a variety of factors. Those most relevant for the physician population seem to be the changing social climate of the last decade and specific survey design considerations. These topics are discussed in turn.

Social Climate of Economic Surveys

In recent years the American public, including physicians, has become increasingly reticent to provide private and public organizations with personal information. Public demand that information be used only for authorized purposes was reflected in two pieces of federal legislation—the Privacy Act (P.L. 93-579) and the Freedom of Information Act (P.L. 94-409). As was true with the general population, physicians were very concerned with the use of their personal, professional, and business information—especially when associated with personal identifiers.

The effects of these conditions were manifested in the letters and telephone calls AMA received concerning identification numbers printed on PSP9. The previous two surveys as well as PSP9 had indicated on the questionnaire that the physician's name would remain "anonymous," when "confidential" would have been more accurate. That is, while the physician's name is not linked to his/her identification code for analysis, the two are indeed linked for follow-up mailings. The term" anonymous" evoked a strong reaction in 1974-1975; the term "confidential" was substituted the following year and physicians' expression of concern subsided.

In addition to changing social climate, certain specific features of the PSP survey design itself could have reduced physician response rates to the questionnaire. Since its inception, the PSP had been used to collect increasing amounts of information. Therefore, it was necessary to reassess the PSP's basic survey design to determine how well the survey was faring in light of a changing social environment.

Complexity and Anonymity Experiment

In 1974 an experiment was devised to assess the response effects of questionnaire complexity and respondent anonymity. A national probability sample of 320 office-based physicians was selected from the AMA Physician Masterfile and were assigned to four experimental groups. Eighty physicians were assigned to each group through a randomization procedure. The issues that were tested were whether complexity (write-in vs. fixed-alternative questions) and anonymity (identification code vs. no code on the questionnaire) were significant factors affecting response to the PSP.

All four groups were mailed initial questionnaires and follow-ups on the same days. The experiment was terminated after approximately two months in the field. The instrument with write-in economic questions and an identification code was mailed as a control since that was the current PSP survey strategy. The remaining three groups received variants on that survey design.

In general, PSP questionnaires utilize "write-in" questions to collect economic information. For example:

1. **What was your 1977 INDIVIDUAL NET INCOME BEFORE TAXES from medical practice to the nearest $1,000?**

1977 Individual Net Income Before Taxes = $________,000.	PROJECTED 1978 Individual Net Income Before Taxes = $________,000.

A less complex method of questionnaire item construction is fixed alternative response categories. For example:

1. **What was your gross income from MEDICAL PRACTICE in 1969? (Please include all income from fees, salary, retainers, etc. before expenses and taxes.)**

______Less than $10,000
______10-14,999
______15-19,999
______20-24,999
______25-29,999
______30-34,999
______35-39,999
______40-44,999
______45-49,999
______50-59,999
______60-69,999
______70-79,999
______80-89,999
______90-99,999
______100,000 or more

(Please specify__________.)

The dimension of respondent anonymity is assessed by including or not including an identification code on the instrument. The identification code is included on the questionnaire for follow-up mailings and for merging survey data with professional and biographic information extracted from the AMA data base.

Overall, there was no significant difference between the four groups with respect to response ($\chi^2=2.15, p>.20$). However, the response was slightly higher for the group receiving the anonymous (no identification code) fixed alternative questionnaire.

In spite of the findings of this experiment, the PSP was subsequently modified. A concerted effort was made to use intervalized, fixed-alternative type questions whenever feasible. Furthermore, a guarantee of confidentiality was printed on the questionnaire next to the identification code.[1]

The findings of this experiment corroborate those from another study in the same time period. Fuller (1974) assessed the effect of anonymity and identification on the responses of U. S. Navy personnel to a mail survey. His findings also indicated group differences in response were not large enough to be of practical importance.

Sources of Nonresponses

The catalogue of nonresponse sources (e.g., ineligibles, not at home, refusals) designated by Kish (1965) is generally instructive with respect to the PSP since questionnaires are mailed to a sample drawn from a well-defined population. Furthermore, the address section of the PSP population file is continuously updated, thereby reducing a potentially large category of ineligible (incorrect) addresses. Nevertheless, ineligible returns that do occur must be excluded from the nonresponse category. The ineligible category has ranged from three to five percent of the total sample depending on the survey year. Ineligibles include retirees, physicians temporarily not in practice or out of the country, inactive, deceased, and federally employed physicians.

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[1] Practical requirements preclude the mailing of totally anonymous questionnaires since follow-up mailings could not be attempted and research files utilizing professional biographic and demographic data could not be merged with PSP data.

In addition, questionnaire returns and follow-up attempts sometimes cross in the mail. Approximately one percent of respondents complete more than one questionnaire causing duplicate returns which must be presorted from the survey.

In their review of the literature on mail survey response rates, Kanuk and Berenson (1975) found that follow-up mailings were very successful in increasing survey response. However, the unit cost of additional information increases with each successive wave.

Follow-up Mailings

Follow-up mailings or telephone call-backs may be an effective method of reducing non-returns in mail surveys. Follow-ups are used extensively in most mail surveys since each added mailing brings additional returns. However, our experience has shown a monotonic decrease in response with each additional call-back. As indicated by Kephart and Bressler (1958), the first follow-up yields a relatively greater percentage of responses. Preliminary response data to a recent survey (PSP12) were fitted to a model shown in Table 2, suggested by Kish (1965).

Table II indicates that a total of 40,554 mailed questionnaires yielded 5,546 responses from the 10,000 possible responses. An average of 7.3 calls per response was needed to achieve an overall response rate of 55.5%. Refusals, out-of-the-country, illness, and certain other categories of participants are excluded from this analysis.[2]

Almost two-thirds of the response was achieved in the first two calls. The last follow-up mailing results include returns over a longer time period than the previous waves. Sixth wave returns may include late returns from previous waves, also. These results point out the substantial costs involved in obtaining responses to an economic mail survey utilizing follow-up techniques.

In a mail survey of graduate medical education program directors conducted by the AMA Research Center, a response rate of 51% was increased to 65% by utilizing telephone reminders. Nonrespondents were called on the telephone and requested to respond as soon as possible. This procedure and others mentioned previously are currently being evaluated for possible use on the PSP. In addition, other remedies for nonresponse, such as substitution, replacement, and subsampling will receive particular attention in future efforts.

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[2] As indicated in Table I, inclusion of refusals, etc., and exclusion of ineligibles result in an effective response rate to PSP12 of 48.7%.

NONRESPONDENTS AND REPRESENTATIVENESS OF PSP DATA

In November 1974, an analysis of nonrespondents to PSP9 was undertaken. A national probability sample of 10,169 office-based physicians was drawn from the AMA Physician Masterfile. An initial mailing with two follow-ups obtained a response rate of 43% after three months.

Before attempting a third follow-up mailing an analysis of respondents and nonrespondents was conducted. Five known key attributes of respondents and nonrespondents were compared to determine if a systematic bias existed with respect to under-reporting of certain groups.[3] Ineligibles and refusals were excluded from the analysis. If a systematic response bias was to be uncovered, consideration would be given to a) substitution of participants for nonresponses or b) replacement of nonresponse categories with nonresponses from previous PSP surveys, among others.

Nonresponse effects were estimated for the following sample attributes: a) specialty, b) geographic location, c) age, d) type of practice, and e) AMA membership. Differential effects of nonresponses were indicated in several attribute categories.

The results of this analysis show that among the physicians surveyed in the Ninth Periodic Survey of Physicians, the specialty of the physician has some, but not a major effect on his/her willingness to respond to the survey. Physicians in the specialties of General Practice, Internal Medicine, Surgery, and Obstetrics/Gynecology respond to the survey at a somewhat lower rate than do physicians in other specialties.

Similarly, the response rate to the survey varies somewhat by geographic region. Physicians in the north central (particularly in the west north central) states have a higher response rate to the survey than other physicians. The southern states, particularly the west south central states, have a lower response rate compared to other areas of the country.

The major factors affecting response to the survey appear to be the physician's age and AMA membership. Members of the AMA had the highest rates of response to the survey.

Association sponsorship, as indicated by Marquis (1977) and Sudman and Bradburn (1974), may account for a large proportion of variation in response. A priori, the differential impact of sponsorship on response is unknown. Ostensibly, AMA sponsorship increases response among members and either decreases response or has no effect on nonmembers of the Association. Nonmembers and physicians in the 46-55 year age range had the lowest response rates. Type of practice did not appear to have an effect on physicians' willingness to respond to the survey.

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[3] Item response analysis was not attempted in the preliminary study although later evaluations have found some item by item differences among the more sensitive financial questions.

The nonrespondent analysis indicated that additional follow-ups and continued experimentation with the PSP methodology should be undertaken. The findings from the response-nonresponse analysis show that nonresponse as well as other factors may have influenced total survey response.

The questionnaire is initially mailed in February of each year. The length of time between surveys is currently fixed. The initial mailing takes place at the end of the first quarter of each successive year. Follow-up mailings occur at monthly intervals thereafter. The physicians sampled now receive the survey questionnaire while federal income tax calculations are presumably fresh in their minds. Therefore, the economic data requested is more likely to be available.

In sum, we have utilized three methods of controlling nonresponse: 1) improved procedures dealing with complexity and anonymity, 2) successive follow-up mailings to nonrespondents, and 3) estimating the sources and effects of nonresponse and apportioning nonrespondents into subgroups.

THIRD BIENNIAL CONFERENCE ON HEALTH SURVEY RESEARCH METHODS, 1979

This conference series is sponsored by the National Center for Health Services Research to promote the exchange of methodological ideas and survey experiences. We presented an earlier version of this paper at the Conference and received helpful suggestions from our paper discussant--Lynn Evans, Ph.D., Baylor University—and from other Conference participants. Dr. Evans believes that the major factor in non-response to the PSP is respondent burden. Respondent burden includes questionnaire length, respondent effort, and frequency of being interviewed.

Our previous survey experiments demonstrated that questionnaire length was not significantly related to response. Respondent effort and frequency of being interviewed, however, were additional factors to be considered in improving PSP response rates.

The AMA is unable to monitor the frequency with which physicians are contacted for information from other organizations. Therefore, Dr. Evans suggested that in order to reduce respondent burden the AMA undertake the following strategies:

1. Having the AMA take the inititative to organize a clearinghouse for physician surveys that would contain representatives from organizations such as the AMA, APHA, AAMC, NCHSR and NCHS.

Table II—Cumulated Response With Successive Follow-Ups for PSP12[a]

Wave of Mailing (Call)	Responses	Cumulated Responses	Calls on Possible Respondents (No. Mailed)	Cumulated Calls	Response Rate (%)	Calls per Response	Mean Calls of Cumulated Response
i	n_i	$\sum_{r=1}^{i} n_r$	t_i	$\sum_{r=1}^{i} t_r$	t_i/n_i	t_i/n_i	$\sum t_r/\sum n_r$
1	2,162	2,162	10,000	10,000	21.6	4.6	4.6
2	1,272	3,434	7,838	17,838	16.2	6.2	5.2
3	847	4,281	6,566	24,404	12.9	7.6	5.7
4	446	4,727	5,729	30,133	7.9	12.9	6.4
5	169	4,896	5,285	35,418	3.2	31.3	7.2
6[b]	650	5,546	5,136	40,554	12.7	7.9	7.3
Total[c]	5,546	--	10,000	40,544	55.5	--	--

[a] For additional discussion on this table format see Kish (1965)

[b] Responses to wave six were cumulated over a longer time period than preceding waves. In addition, follow-up mailings and late responses crossing in the mails are contained in this category.

[c] Inclusion of refusals, etc. and exclusion of ineligibles would result in an effective survey response of 48.7% to PSP12.

2. Conducting the survey under the joint auspices of selected medical schools in each region, the state medical association and the AMA.

3. Offering to provide the sampled physician a discount on a new or renewal AMA membership in turn for completing the PSP questionnaire.

4. Offering to provide the sampled physician a personalized feedback report describing how he or she ranks when compared with the remainder of the sample. (Evans 1979).

All of these recommended strategies are being considered by the AMA for future PSP surveys.

In addition to Dr. Evans thoughtful long-term recommendations, conference participants suggested several short-term strategies for dealing with nonresponse. Several participants suggested utilizing telephone reminders to nonrespondents to mail questionnaires. Nonrespondents would be called on the telephone and requested to respond as soon as possible. This procedure was implemented for PSP13 in 1979 and is discussed in the next section.

Telephone Reminder Experiment (PSP13)

The initial mailing of 10,000 PSP13 questionaires took place in March, 1979. After one month, the overall response rate was 20.6 percent at which time a follow-up mailing was undertaken. The overall response rate after eight weeks in the field was 35.4 percent.

The second follow-up attempt consisted of two different mediums for contacting nonrespondents: mail questionnaire follow-ups and telephone reminders. The telephone reminders were conducted by two different commercial interview firms for comparison purposes. The 6,935 nonrespondents to the initial and first follow-up mailing were randomly assigned to one of three experimental groups: 1) physicians who were mailed a second follow-up questionnaire (3,985); 2) physicians who were contacted by commerical interview firm A and reminded to respond to the questionnaire (1,725); and, 3) physicians who were contacted by commercial interview firm B (1,225).

The only difference between firms A and B was in the number of call-back attempts. Interview firm A made three telephone attempts to remind the physician to respond. Interview firm B made as many calls as needed to reach a quota of 1,225 contacts. The text read by the interviewer over the phone was virtually identical for both firms. Two more mail follow-ups were sent to all remaining nonrespondents at monthly intervals following the experiment.

A comparison of the interviews of both firms is shown in Table III. In general, the experience of both firms was fairly similar in those cases where the disposition of the questionnaire was determined. Over

500 respondents indicated a willingness to return the PSP questionnaire. An additional 1,388 needed another questionnaire for a variety of reasons.

Table III—PSP Telephone Reminder Experiment: Comparison of Commercial Interview Firm's Experience With PSP13 Phone Reminders

	Firm A	Firm B
Usable Sample	1,725 (100%)	1,225 (100%)
Refused to Complete	20 (1%)	23 (2%)
Unable to Complete	268 (16%)	52 (4%)
Disposition Determined	1,437 (83%)	1,150 (94%)
Did return Questionnaire	132 (7%)	117 (9%)
Will return Questionnaire	296 (17%)	232 (19%)
Will Not Return Questionnaire	337 (19%)	154 (13%)
Need New Questionnaire	691 (40%)	697 (53%)

Results indicate that the telephone/mail method employed by the interview firms generated 375 respondents for a 12.7 percent response to the third call-back attempt. In comparison, the mail/mail method resulted in 1,759 respondents (22.3 percent response) at substantially lowerly cost per return. Thus, it was concluded that among this sample of physicians, the mail questionnaire approach is effective and less costly than utilizing telephone reminders to increase response.

The telephone reminder experiment demonstrated an important aspect of the PSP survey design. That is, a substantial number of ineligible respondents were included in the effective survey sample.

Additional Nonresponse Strategies

Two other strategies were implemented for PSP13 and are being continued: a) an eligibility postcard and b) a telegram-like reminder to respond.

The fourth mailing of the PSP questionnaire contains an "AMA-GRAM" which requests the respondents help in collecting medical practice information. This letter is structured to look like an actual telegram with a statement requesting immediate response for the success of the survey.

In addition, prior to the fourth mailing of the PSP, an elibility postcard is sent to all nonrespondents. This instrument requests information on the physician's current professional activities. If the physician does not meet sample selection criteria—active, non-federal office-based, patient care—he/she is excluded from the effective sample. This procedure has been very effective in identifying the suspected 6 to 8 percent ineligible physicians in the PSP sample.

FUTURE DIRECTIONS FOR THE PERIODIC SURVEY OF PHYSICIANS

The need for complex socioeconomic information on medical practice will increase in the future. Mail, telephone and home interview strategies in medical economic surveys face the concommitant problems of maintaining response rates and survey data quality. On the one hand, large scale surveys are relatively expensive and require a substantial time investment, from field work to research file construction and data analyses. On the other hand, smaller scale surveys like the PSP are relatively inexpensive, but have seen a gradual slippage in response rates. The PSP survey takes approximately nine months to produce an edited research file merged with other relevant research and data files. The timeliness of this type of survey must be evaluated in a cost effectiveness framework. The issue of cost effectiveness in maintaining response rates requires further analysis, including the development of improved strategies for dealing with nonresponse.

Physicians are an overly burdened respondent group, which may account in part for lowered response rates. We plan to continue developing special strategies for collecting valid and timely physician data.

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Trends in Physicians' Incomes, Expenses, and Fees: 1970-1980 *by David L. Goldfarb**

INTRODUCTION

Price increases in the general economy continue to receive widespread attention with the intractability of "double-digit" inflation in the U.S. during 1979 and 1980. Although the relatively more rapid price increases in other sectors of the economy have overshadowed increases in physician fees and other medical components of the Consumer Price Index (CPI), the economics of medical practice continues to be of interest to the public and to policymakers in the health sector.

This report employs data from the AMA's Seventh through Fourteenth Periodic Surveys of Physicians to examine trends in physicians' incomes, expenses, and fees during the period 1970-1980. The objective is to provide basic information on changes in the economics of medical practice over the decade of the 1970s. Physicians' net incomes, professional expenses, and fees are discussed in separate sections followed by a concluding section which explores some inter-relations among these three factors.

NET INCOME

Data on physicians' pre-tax, average net income from medical practice, and the average annualized percentage growth of net income are presented in Table I. Physician income data are examined in aggregate, and for seven major specialty groups for the period 1970 through 1980.[1] During this period, the typical physician's net income increased from $41,800 in 1970 to $80,900 projected in 1980, a 93.5 percent increase. This total increase implies an average annualized growth of 6.8 percent over the ten-year period.

Turning to individual specialties, generally those specialty groups with high levels of net income in 1970 had high net income rankings in 1980. For instance, Surgery had the highest mean net income in 1970 and the highest expected level of net income in 1980. Obstetrics/Gynecology and Internal Medicine also maintained high net incomes during this period moving in rank from second to third and third to fourth, respectively. Other specialty groups (Anesthesiology and Psychiatry), however, experienced substantial changes in their net income rankings among the seven specialty groups reported in Table I. Over the period 1970-1980, Anesthesiology rose in ranking from fifth to second. For Psychiatry the converse is true, with the ranking falling from fourth to sixth.

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[1] Throughout this report the average net incomes and expenses used for 1980 were projected by respondents. There is limited evidence that during periods of rapid inflation, such as occurred in 1980, physicians underestimate both their net incomes and expenses. Thus, it is possible that actual net income and expenses from 1980 may turn out to be higher than the projected figures reported in Table I.

The three specialty groups that ranked highest in mean net income in 1970 (Surgery, Obstetrics/Gynecology, and Internal Medicine) also had higher than average annualized growth rates over the 1970-1980 period. As suggested by this pattern, the relative dispersion in average net income across these specialty groups increased over the ten-year period. The coefficient of variation (a measure of relative variation) of mean net incomes of the seven specialty groups increased from 0.15 in 1970 to 0.20 in 1980, indicating an increase in relative dispersion of mean net income levels from 1970 to 1980.[2]

PROFESSIONAL EXPENSES

Table II presents average professional expenses reported by physicians over the period 1970 through 1980. Average professional expenses are reported for each of the seven specialty groups, and for all specialties combined. Over the ten-year period, professional expenses of the typical physician rose from $24,300 in 1970 to $58,100 projected for 1980, a 139 percent increase. Thus, the professional expenses of the typical physician more than doubled in ten years. Since net income from medical practice increased 93.5 percent over this same period, the percentage of the typical physician's gross income (net income plus professional expenses) accounted for by expenses increased over the ten-year period, and the percentage attributable to net income decreased.

The annual percentage increase in professional expenses varied across the seven sepcialty groups. Surgery, Anesthesiology, and Obstetrics/Gynecology all had annual percentage increases in expenses of over ten percent. On the other hand, Psychiatry experienced a 6.4 percent annual increase in expenses. With the exception of Anesthesiology, those specialties with high expenses in 1970 and 1980 also had high rates of increase in expenses over the ten-year period. As with net income, this pattern implies that the relative dispersion in professional expenses has increased across the seven specialty groups in Table II. The coefficient of variation of mean professional expenses of the seven specialty groups increased from 0.33 in 1970 to 0.37 in 1980, indicating a slight increase in the relative dispersion of expenses over the ten-year period.

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[2] The coefficient of variation is defined as the standard deviation divided by the mean value. Thus, the larger is the coefficient of variation, the greater the relative dispersion.

Table I—Average Net Income From Medical Practice by Specialty, 1970-1980

Specialty	1970	1971	1972	1973	1974	1975	1976[b]	1977	1978	1979	1980[b]	Compound Percentage Growth 1970-1980
All Specialties[a]	$41,800	$45,300	$47,200	$48,600	$52,000	$56,400	$59,500	$61,200	$65,500	$78,400	$80,900	6.8%
Gen. Prac.	33,900	39,800	41,300	41,900	44,700	45,400	47,400	51,200	54,600	62,000	63,300	6.4
Int. Med.	40,300	42,900	44,700	47,800	51,400	57,000	60,500	61,500	63,800	76,200	79,100	7.0
Surgery	50,700	54,000	56,000	57,200	60,500	68,200	73,200	74,000	82,600	96,000	98,600	6.9
Pediatrics	34,800	38,500	38,900	41,200	42,100	44,300	47,000	48,200	51,200	60,400	63,300	6.2
Ob./Gyn.	47,100	51,100	53,200	55,400	61,700	63,300	65,800	69,900	70,300	91,800	92,500	7.0
Psychiatry	39,900	37,200	39,100	38,500	41,300	44,800	47,600	48,200	50,200	62,600	65,100	5.0
Anesthesiology	39,400	47,300	49,500	48,100	54,400	57,100	60,100	65,500	74,200	91,400	94,900	9.2

[a] Total includes Radiology and "Other" categories. [b] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1980. Center for Health Services Research and Development, American Medical Association.

Table II—Average Tax Deductible Professional Expenses by Specialty, 1970-1980

Specialty	1970	1971	1972	1973	1974	1975	1976[b]	1977	1978	1979	1980[b]	Compound Percentage Growth 1970-1980
All Specialties[a]	$24,300	$28,900	$31,300	$32,200	$34,000	$38,500	$42,400	$45,500	$46,400	$52,900	$58,100	9.1%
Gen. Prac.	24,200	32,100	34,500	34,000	36,700	38,600	42,400	46,100	47,800	55,700	60,600	9.6
Int. Med.	25,500	28,300	31,300	34,000	35,800	40,400	45,600	45,600	44,800	52,500	59,200	8.8
Surgery	27,100	32,900	35,800	38,000	39,300	49,100	54,800	60,400	63,400	69,300	75,400	10.8
Pediatrics	24,900	28,500	30,000	32,400	30,000	34,600	36,600	39,100	35,100	51,000	53,600	8.0
Ob./Gyn.	27,700	33,300	36,500	37,200	41,900	48,500	54,400	60,900	61,900	67,000	74,000	10.3
Psychiatry	13,300	13,000	14,100	14,300	14,000	18,700	19,800	19,300	24,200	23,100	24,800	6.4
Anesthesiology	11,200	12,700	13,900	14,000	19,300	20,000	22,200	25,900	25,300	26,300	30,100	10.4

[a] Total includes Radiology and "Other" categories. [b] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1980. Center for Health Services Research and Development, American Medical Association.

Table III—Average Fee for Initial Office Visit by Specialty, 1970-1980[a]

Specialty	1970	1971	1973	1974	1975	1976[c]	1978	1979	1980	Compound Percentage Growth 1970-1980
All Specialties[b]	$14.23	$16.00	$16.98	$19.55	$21.20	$24.86	$27.60	$30.47	$33.28	8.9%
Gen. Practice	8.46	9.65	10.74	12.03	13.11	14.80	16.55	18.21	20.43	9.2
Int. Medicine	17.81	20.38	20.51	23.11	26.11	31.27	32.53	38.18	40.18	8.5
Surgery	14.72	16.43	17.69	18.87	20.81	23.29	26.52	29.04	31.83	8.0
Pediatrics	9.95	11.18	12.20	14.49	16.18	17.45	19.03	21.06	22.15	8.3
Ob./Gynecology	14.23	17.59	19.68	22.07	23.57	27.41	29.85	30.70	34.03	9.1
Psychiatry	32.64	35.58	37.51	41.39	44.61	50.15	54.63	56.80	62.13	6.6

[a] No comparable data point is available for 1972 and 1977. [b] Total includes Radiology, Anesthesiology, and "Other" categories. [c] Projected by physician respondents.

Source: Periodic Survey of Physicians, 1972-1980. Center for Health Services Research and Development, American Medical Association.

FEES

The final area to be examined in this report is changes in physicians' fees. Table III presents average fees charged for an initial office visit (IOV) for all physician respondents and for selected specialties for the years 1970 through 1980 (comparable data were not available for 1972 or 1977). Average annualized percentage growth rates over the entire ten-year period are also presented.

Over the ten-year period, the average physician's IOV fee increased from $14.23 in 1970 to $33.28 in 1980, a 134 percent increase. Psychiatrists reported the highest IOV fee for each year during the period, with physicians specializing in Internal Medicine ranked second. General practitioners consistently reported the lowest IOV fee over the entire period. General practitioners' average IOV fee, however, increased by an annual average of 9.2 percent, the largest increase of the specialties presented. Specialists in Obstetrics and Gynecology also averaged annual increases in their IOV fee in excess of 9.0 percent. Psychiatrists, on the other hand, had the lowest rate of increase in IOV fee over the period. As suggested by this pattern, the relative dispersion in average IOV fee across the six specialty groups of Table III decreased slightly. The coefficient of variation for the average IOV fee for the six specialty groups decreased from 0.53 in 1970 to 0.52 in 1980.

NET INCOMES, EXPENSES, AND FEES

For the typical physician in the period 1970-1980, net income from medical practice grew less rapidly than IOV fee, which, in turn, grew less rapidly than professional expenses. For all seven specialty groups examined, the rate of increase in professional expenses exceeded the rate of growth in net income from medical practice. This indicates that physicians have not passed the full effect of increased professional expenses on to patients. Thus, expenses have accounted for an increasing proportion of the physician's gross income over the period 1970 to 1980.

Examination of average net incomes, expenses, and fees for the individual specialty groups indicates that some changes in the relative dispersion of these three items has occured. Over the ten-year period, 1970-1980, the relative dispersion in average net income and average expenses for the seven specialty groups examined has increased. On the other hand, the relative dispersion in average IOV fee for the six specialty groups of Table III has decreased slightly.

Relative Changes in Medical Care Prices: The Consumer Price Index, 1970-1980 *by Gerald L. Glandon**

INTRODUCTION

During 1980 the rate of inflation measured by the Consumer Price Index (CPI) moderated some from the rate in 1979. Despite this moderation, 1979 and 1980 were the first two successive years of "double-digit" inflation in the United States since 1919 and 1920. During 1980 the CPI's all items index, a broad measure of the price of a market basket of goods and services, rose 12.4 percent compared to a 13.3 percent increase in 1979.

The new President has made curbing inflation a primary goal of his administration. By attempting to reduce government deficits and control the growth of the money supply, the Reagan Administration hopes to reduce the inflation rate. These programs replace the voluntary wage and price constraints enacted by the Carter Administration in 1979. At the end of 1977, the health care sector initiated a Voluntary Effort to Contain Health Care Costs (VE). Although causality may not be inferred, aggregate medical care prices and the prices of physicians' services increased less rapidly than the general price level in 1980 as they had in both 1978 and 1979. Relative to increases in the medical care index (10.0 percent) and the physicians' services index (11.0 percent), the all items index increased by a comparatively large 12.4 percent.

This report, which updates previous Profile articles, discusses changes in the CPI during calendar year 1980, focusing particular attention on the medical care components of the CPI. Further, the report examines trends in consumer prices in general and medical care prices in particular, during the 1970s. Annualized rates of change will be utilized throughout this report so that price changes over periods of varying durations can be compared directly. Appendix A explains the computation of this annualization.

The Consumer Price Index for All Urban Consumers (CPI-U), compiled by the Bureau of Labor Statistics, is used in this report. Data from this series represent the prices of a typical market basket of goods and services consumed by about 80 percent of U.S. consumers. No more comprehensive or representative price data exist. However, because the CPI was substantially revised in 1978, only limited comparisons between current price changes and those made before 1978 can be made.

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Changes in the medical care index, the physicians' services index, and selected other indices are reviewed for 1980 and compared to 1979 in the following section. Subsequent sections present a historical perspective by examining changes in selected components of the CPI from 1970 to 1980.

CHANGES IN COMPONENTS OF THE CONSUMER PRICE INDEX 1979 AND 1980

Medical Care and its Components

Table I presents annual percentage changes in selected components of the medical care component of the CPI for 1979 and 1980. Table II displays annualized rates of change for these indices in each of the calendar quarters of the two years.

Analysis of the data in Table I indicates that the rate of increase in the medical care index was about the same in 1979 as in 1980 (10.1 percent and 10.0 percent, respectively). The physicians' services price index rose 9.4 percent in 1979 and 11.0 percent in 1980. The annual increase in physicians' services prices was less than the increase in the medical care index in 1979 but exceeded the increase in the medical care index in 1980.

The medical care services price index increased faster in 1979 than in 1980 (10.6 percent versus 10.0 percent, respectively). Further, the increases in the medical care services index and in the medical care index were equal in 1980. Relatively large increases in the rate of growth of most elements in the medical care index occurred in 1980 compared to 1979. Primary among these is the increases in the rate of growth of the other hospital services index from 11.3 percent in 1979 to 15.1 percent in 1980. Other points of interest concerning the medical care services price index include:

- Physicians' services price increases expanded from 9.4 percent in 1979 to 11.0 percent in 1980.
- Physicians' services prices (11.0 percent) increased more in 1980 than either medical care services prices (10.0 percent) or medical care prices (10.0 percent).
- The hospital room charge index (13.9 percent) and the other hospital services index (15.1 percent) increased more rapidly in 1980 than did the other components of the medical care index reported.

Medical care commodities rose at a greater rate in 1980 (10.0 percent) than in 1979 (7.6 percent). While medical care commodities increased much less than the aggregate medical care index in 1979 (7.6 percent versus 10.1 percent, respectively), the rates of increase in these two components were equal in 1980 (10.0 percent). Other points

Table I—Annual Percentage Increases in Selected Components of the Medical Care Component of the CPI, 1979 and 1980

Item	1979	1980
All Items	13.3	12.4
Medical Care	10.1	10.0
Medical Care Commodities	7.6	10.0
Prescription Drugs	7.5	9.8
Nonprescription Drugs and Medical Supplies	7.6	10.1
Medical Care Services	10.6	10.0
Physicians' Services	9.4	11.0
Dental Services	9.7	10.7
Hospital Room Charge	11.1	13.9
Other Hospital Services	11.3	15.1
Insurance*	11.9	8.2

*Insurance is not reported directly by the Bureau of Labor Statistics.

Source: CPI Detailed Reports for December 1978 and December 1979. December 1980 figures derived from telephone communication with the Bureau of Labor Statistics, Washington, D. C., January 23, 1981.

of interest concerning medical care commodities include:

- The prescription drug price increase was greater in 1980 than in 1979 (9.8 percent versus 7.5 percent, respectively).
- Nonprescription drugs and medical supplies, which consist of eyeglasses, medical supplies, and over-the-counter drugs, increased more in 1980 than in 1979 (10.1 percent versus 7.6 percent, respectively).

Table II presents annualized rates of change for each of the calendar quarters in 1979 and 1980 for a selected set of components of the medical care index. While few obvious trends are evident, the data in this table serve to demonstrate the volatility of the indices. For example, during the two-year period, increases in the hospital room charge index range from an annualized rate of 17.9 percent in the first quarter of 1980 to an annualized rate of 5.3 percent in the second quarter of 1979.

As previously noted, the all items index increased at a greater rate in 1979 than in 1980. This is evident from the annualized rates of change presented in Table II. While the rate of increase for the first quarter of 1980 was large relative to the first quarter of 1979, the rates of increase for the three remaining quarters were lower in 1980 than in 1979. In particular, the annualized increase in the third quarter of 1980 (6.8 percent) was much smaller than the annualized increase in the third quarter of 1979 (13.2 percent). Other points of interest concerning the quarterly data presented in Table II include:

- Except for the third quarter of 1979, the annualized rate of growth of physicians' services prices was larger in each quarter of 1980 compared to the corresponding quarter of 1979.
- The hospital room charge index rose more in each quarter of 1980 than in the corresponding quarter of 1979.
- The annualized rate of increase in the first quarter of 1980 was the highest in the eight-quarter period for the all items index, medical care index, and each component of medical care reported.

Major Components of the CPI

Table III presents annual percentage increases in the all items index of the CPI, the seven components of the all items index, and four special indices, for 1979 and 1980. Most notably, Table III illustrates that, with the exception of apparel and upkeep as well as entertainment, the all items index and each of its components experienced "double-digit" inflation in 1980. In 1979, energy and mortage interest costs appear to have played major roles in the rate of inflation as measured by the CPI. The impact of increased energy costs on the rate of inflation moderated significantly in 1980.

The rate of increase of medical care prices was 10.0 percent in 1980, nearly equal to the 10.1 percent increase that occurred in 1979. However, the all items index rose 13.3 percent in 1979 and 12.4 percent in 1980, a decrease of about 0.9 percentage points. Therefore, medical care price increases were a larger proportion of the increase in the all items index in 1980 than in 1979.

The rate of increase reported for the all items index is a weighted average of the rates of increase of the seven components listed below in Table III. This average is computed by weighting the percentage increase in each component by the proportion of total consumer expenditures it represents, i.e., its share of the typical urban consumer's "marketbasket." These expenditure weights, which are adjusted annually, affect the relative importance of each of the seven components of the all items index. For example, in 1980 housing represented 45.0 percent of total consumer expenditures. Price increases in the housing component are the single most influential component in the all items index.

In 1980, only price increases for housing (13.7 percent) and transportation (14.7 percent) exceeded the increase in the all items index (12.4 percent), but these two components represented 63.6 percent of total consumer expenditures. The two components with relatively small percentage price increases, apparel and upkeep (6.8 percent) and entertainment (9.6 percent) together represented only 8.8 percent of total consumer expenditures.

Table III—Annual Percentage Increases in Major Components of the Consumer Price Index, 1979 and 1980

	Percentage Increase	
Major Components	1979	1980
All Items	13.3	12.4
Food and Beverages	10.0	10.1
Housing	15.2	13.7
Apparel and Upkeep	5.5	6.8
Transportation	18.2	14.7
Medical Care	10.1	10.0
Entertainment	6.9	9.6
Other Goods and Services	7.9	10.1
Special Indices		
All Services	13.7	14.2
All Commodities	13.0	11.1
Energy	37.4	18.1
Mortgage Interest Cost	34.7	27.6

Source: CPI Detailed Report for December 1978 and December 1979. December 1980 figures derived from telephone communication with the Bureau of Labor Statistics, Washington, D. C., January 23, 1981.

The annual increases experienced by the seven components were more similar in 1980 than in 1979. The rate of increase in the two fastest growing components in 1979 declined in 1980. The increase in the transportation index declined from 18.2 percent in 1979 to 14.7 in 1980 and the increase in the housing index declined from 15.2 percent in 1979 to 13.7 percent in 1980. Conversely, the rate of increase in the two slowest growing components in 1979 increased in 1980. The change in the apparel and upkeep index rose from 5.5 percent in 1979 to 6.8 percent in 1980 and the change in the entertainment index rose from 6.9 percent in 1979 to 9.6 percent in 1980.

Energy and mortgage interest costs, special indices presented in Table III, warrant particular attention. The energy index is created from a combination of energy components included in the housing and transportation components of the CPI. Energy represents about 10.3 percent of total consumer expenditures. Mortgage interest costs, a part of the housing component, represent 7.3 percent of total consumer expenditures. In 1979, the energy index rose 37.4 percent and mortgage interest costs rose 34.7 percent. These two indices, together representing 17.6 percent of consumer expenditures, contributed greatly to inflation. However, in 1980 the rate of growth of both indices declined. The energy index declined to 18.1 percent, and the mortgage interest cost index declined to 27.6 percent. While both indices still increased rapidly in 1980, the decline in the overall rate of inflation in 1980 reflects, in part, decelerated growth of these two indices. In particular, housing and transportation increased much less rapidly due to relatively moderate energy and mortgage interest price increases. To further illustrate the impact of energy, the all items index was recomputed with energy components deleted. In 1980, the all items less energy index rose 11.7 percent compared to 12.4 percent increase with energy included.

Summary of CPI Changes in 1979 and 1980

Figure 1 presents percentage increases in selected components of the CPI in 1979 and 1980. While the data have appeared in either Tables I or III above, this presentation emphasizes the decrease in the rate of inflation of 1980 compared to 1979 and puts the increases that occurred for selected components in broader perspective. The figure shows that the rates of increase in both the all items and the all services CPI indices exceeded the rate of increase in all of the medical care indices in 1979. However, in 1980 the hospital room and other hospital services indices increased more than the all items index.

TRENDS IN CHANGES IN SELECTED COMPONENTS OF THE CPI, 1970-1980

Table IV presents calendar year changes in selected components of the CPI for the years 1970-1980 and the average annual implied percentage increase for the entire period. This table is accompanied by Figure 2 which plots annual percentage increases for the all items and physicians' services price indices.

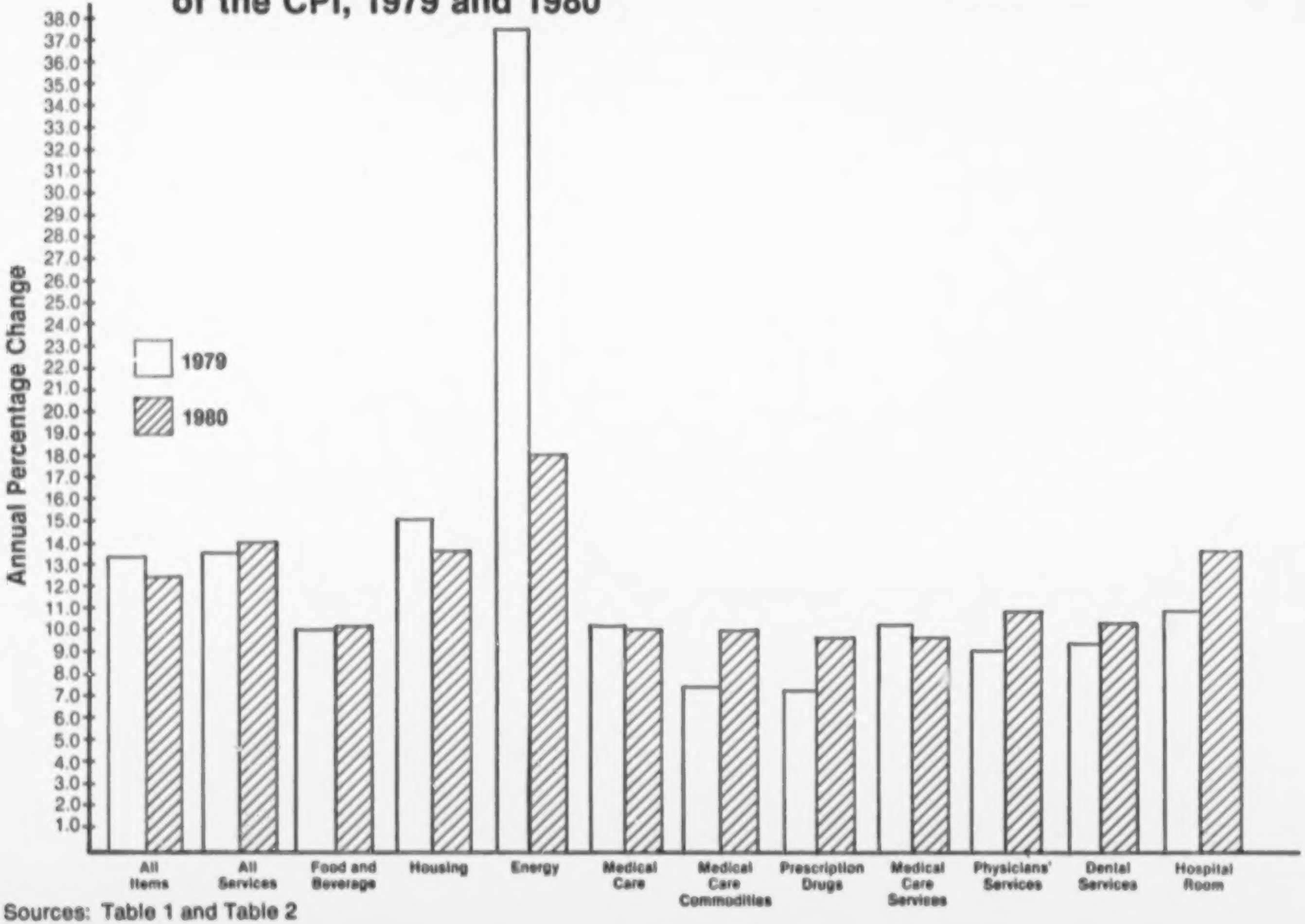
The annual percentage increase in the physicians' services component of the CPI exceeded the annual increases in the all items index for six of the eleven years reported and for the period as a whole. Only for the two full calendar years for which the economic stabilization program was in effect (1972 and 1973) and the three calendar years since the beginning of the Voluntary Effort (1978, 1979, and 1980) has the physicians' services price index increased less than the all items index. For the period as a whole, physicians' services prices rose 8.3 percent on an annual basis versus a 7.8 percent annual increase in the all items index.

Table II—Annualized Rates of Growth in Selected CPI Components, Calendar Years 1979 and 1980

Component	1979				1980			
	First Quarter Jan.-March	Second Quarter April-June	Third Quarter July-Sept.	Fourth Quarter Oct.-Dec.	First Quarter Jan.-March	Second Quarter April-June	Third Quarter July-Sept.	Fourth Quarter Oct.-Dec.
All Items	12.8	15.1	13.2	12.2	18.4	13.7	6.8	11.1
Medical Care	11.1	6.7	10.5	12.0	16.0	7.1	9.2	7.9
Medical Care Commodities	7.5	7.1	6.7	9.0	11.2	11.2	8.3	9.2
Prescription Drugs	9.1	6.2	6.4	8.3	12.9	10.7	7.2	8.4
Medical Care Services	11.9	6.7	11.2	12.6	16.9	6.4	9.3	7.9
Physicians' Services	11.9	7.4	11.4	6.8	16.5	10.9	7.6	9.2
Dental Services	11.4	7.8	5.5	14.1	18.2	11.0	9.5	4.6
Hospital Room Charge	12.9	5.3	11.9	14.5	17.9	6.9	16.0	15.1

Source: CPI Detailed Report for December 1978; March 1979; June 1979; September 1979; December 1979; March 1980; June 1980; and September 1980. December 1980 figures derived from telephone communication with the Bureau of Labor Statistics, Washington, D. C., January 23, 1981. Figures are not seasonally adjusted.

Figure 1 · Annual Percentage Increases in Selected Components of the CPI, 1979 and 1980



Sources: Table 1 and Table 2

Table IV—Annual Percentage Increases in Selected Components of the Consumer Price Index, 1970-1980*

Selected Items	Average Annual Percentage Increase 1970-1980	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
All Items	7.8	5.5	3.4	3.4	8.8	12.2	7.0	4.8	6.8	9.0	13.3	12.4
All Services	8.5	8.2	4.1	3.6	6.2	11.3	8.2	7.3	7.9	9.3	13.7	14.2
Food and Beverages	7.9	2.5	4.2	4.4	18.5	12.0	6.2	7.1	7.6	11.6	10.0	10.1
Housing	8.4	7.1	3.4	3.4	6.9	13.4	7.5	5.4	7.6	9.9	15.2	13.7
Medical Care	8.2	7.3	4.8	3.3	5.2	12.4	9.9	10.1	8.8	8.8	10.1	10.0
Prescription Drugs	4.4	0.1	1.5	-1.2	0.2	5.2	5.7	5.0	7.1	8.3	7.5	9.8
Physicians' Services	8.3	8.1	5.2	2.4	4.0	13.3	11.8	9.7	9.2	8.1	9.4	11.0
Dental Services	7.2	5.5	6.4	2.8	3.7	11.4	7.8	6.8	7.3	7.2	9.7	10.7
Hospital Room Charge	11.4	14.0	9.2	5.0	5.7	16.5	14.7	13.0	10.8	12.4	11.1	13.9

*Percentage increases are computed using December to December indices for each year.

Source: Consumer Price Index for data 1970-December 1973. CPI Detailed Report for December 1974-December 1979. December 1980 figures are derived from telephone communication with the Bureau of Labor Statistics, Washington, D. C., January 23, 1981. Figures are not seasonally adjusted.

During the eleven-year period reported, the all services index (which includes physicians' services) increased more than the all items index in all but a single year. For the period as a whole, the all services index increased 8.5 percent per year while all items increased 7.8 percent per year, on average.

Other points of interest concerning the trends in prices reported include:

- Medical care as a whole and the physicians' services index increased nearly an equal amount over the period (8.2 percent versus 8.3 percent per year, respectively). On a year-by-year basis, medical care price increases exceeded physicians' services price increases in six of the eleven years.
- Hospital room charges increased at a greater average annual rate than medical care as a whole for the entire period (11.4 percent versus 8.2 percent, respectively) and for each year individually.
- Dental services prices increased at a lower annual rate than physicians' services prices for the period as a whole (7.2 percent versus 8.3 percent, respectively) and for eight of the eleven years individually.
- Prescription drug prices increased at a lower annual rate for the entire period than did medical care as a whole or any of the other medical care components presented. The increase in this component was 4.4 percent per year for the entire period; however, for the first four years, the implied percentage increase was 0.1 percent per year versus 6.9 percent per year average increase for the last seven years of the period.

Figure 2, which plots annual increases in both physicians' services prices and the all items index, illustrates the similarity in the movement of these two indices. While physicians' services prices have generally increased at a greater rate than the all items index, the two indices generally reach short-term peaks and troughs in the same years.

Appendix

An Explanation of the Method Used to Compute the Implied Average Annual Percentage Change

This report presents average annual percentage changes in the Consumer Price Index (CPI) and some of its components for calendar 1980 and other selected time periods. The observed change is the result of the action of an annual percentage change compounded over the observed time period.

The method of deriving the average annual percentage change is straightforward. From an initial time period (t_o) to a final time period (t_n) the change in the CPI can be shown as:

$$CPI_{t_n} = CPI_{t_o} \times (1 + r)^n,$$

where r is the constant percentage change per unit of time and n is the number of periods between t_o and t_n. Solving for r, one obtains:

$$r = \left(\frac{CPI_{t_n}}{CPI_{t_o}} \right)^{1/n} - 1.$$

Thus, to solve for the average annual percentage change in CPI from 1970 to 1980, one substitutes

$$r = \left(\frac{\text{CPI/Dec. 1980}}{\text{CPI/Dec. 1969}} \right)^{1/11} - 1$$

The ratio of the CPIs is taken to the 1/11th power because there are 11 years from 1970 to 1980. r, then, is the average annual percentage change in the CPI implied by the observed change in the index number from 1970 to 1980.

Part III —Selected Tabulations

Characteristics of Medical Practice

The data presented in this section were obtained from the AMA's Fourteenth Periodic Survey of Physicians (PSP14). This essentially annual survey, conducted by the AMA Center for Health Services Research and Development, was initiated in 1966. PSP14 questionnaires were mailed to a stratified random sample of 11,494 non-federal, office-based physicians in the United States drawn from the AMA Physician Masterfile. This survey yielded a usable sample of approximately 5,100 physicians. A copy of the questionnaire appears in the Appendix to this volume.

SAMPLE SELECTION

The PSP sample is selected from an "office-based" subset of the entire population of United States physicians in the Masterfile. The office-based physicians comprising this subset report spending the greatest proportion of their hours in direct patient care in either a solo, partnership, group practice, or other medical care setting. Only hospital residents and those patient-care physicians who report that a plurality of their professional hours are spent as full-time salaried hospital staff are excluded from this office-based category. Other major categories of physicians excluded from the population from which the PSP sample is drawn include:

- federally-employed physicians;
- doctors of Osteopathy;
- graduates of foreign medical schools who are only temporarily licensed to practice in the U.S.;
- physicians for whom no current address is available; and
- physicians who were included in the sample for the preceeding PSP.

To classify physicians into the categories listed above, the Masterfile is updated by a triennial census and a computerized weekly updating system. The weekly updates may be signaled by information obtained from AMA mailings, physician correspondence, hospitals, government agencies, specialty boards, and licensing agencies. Any indication of a change in professional status or address triggers a questionnaire similar to the one used in the latest census year.

The annual Periodic Survey of Physicians is currently based on a single-stage, stratified sample with systematic selection from the population described above. Stratification is by specialty. Hence, following an initial random sort, a secondary sort of specialty category, and a random start, a systematically selected sample of 11,494 physicians, proportional to the size of the specialty strata, is obtained. The sample drawn represents approximately five percent of the non-federal, office-based physicians practicing throughout the United

States. The nine major specialty categories used in the sample selection procedure for the PSP are described below.

A final check consists of a comparison of the PSP population's and the sample's frequency distribution on the basis of specialty, age, sex, and geographic location. Chi-square analyses are performed as a test for significance of differences between the distribution of the sample and the population. If the sample does not proportionately represent the population of the non-federal, office-based physicians, a new sample is selected.

DATA COLLECTION AND FILE CONSTRUCTION

An initial mailing of 11,494 questionnaires took place on February 4, 1980. Five follow-up questionnaires were mailed to nonrespondents at monthly intervals. When the survey was closed in September 1979, 5,093 usable questionnaires had been returned.

The response rate for PSP14 was over fifty percent. Response rate is determined by dividing the number of questionnaires received from eligible physicians by the number of eligible physicians included in the sample. Despite continual updating, the AMA Physician Masterfile contains some ineligible physicians, and some of these ineligible physicians receive a questionnaire. Ineligible physicians could include recent retirees, physicians temporarily not in practice or out of the country, or physicians who have recently changed from office-based patient-care practice to another professional activity.

Nonresponse bias is a potential problem in all surveys, particularly when the response rate is on the order of fifty percent, as has been the recent experience of the Periodic Survey of Physicians. If the work patterns and practice characteristics of nonrespondents differ significantly from respondents, then the estimates obtained through PSP14 may be biased in one direction or another. The extent of the bias, if it exists, is difficult to assess unless work patterns and practice characteristics of nonrespondents can be ascertained. However, it is possible to compare certain demographic characteristics of respondents with the original population to determine if under-reporting of certain groups has occurred. Comparisons of sample respondents with the population of office-based, patient-care physicians on the basis of specialty, location, age, and sex are presented in Table I through Table IV.

All questionnaires were reviewed and edited prior to keypunching. After the data for PSP14 were keypunched, a series of computer edits were performed. Any errors detected by this process were verified against the original questionnaires and appropriate modifications or deletions were made.

Following the editing and verification procedures, the raw data were linked with biographic information on each physician from the Masterfile as well as demographic information on the geographic area in which the physician practices. Confidentiality is assured since all identifiers (names, addresses, medical education numbers) are erased once the necessary computer links have been accomplished.

Table I—Distribution by Specialty of the Population and Respondents to the Fourteenth Periodic Survey of Physicians

Specialty Group	Population		Respondents	
	No.	%	No.	%
General/Family Practice	43,707	19.0%	985	19.3%
Internal Medicine	41,832	18.2	927	18.2
Surgery	54,020	23.5	1,147	22.5
Pediatrics	14,679	6.4	333	6.5
Obstetrics-Gynecology	16,833	7.3	383	7.5
Radiology	11,006	4.8	218	4.3
Psychiatry	15,315	6.7	382	7.5
Anesthesiology	9,522	4.1	214	4.2
Other	22,575	9.8	504	9.9
Total	229,781	100.0	5,093	100.0

Table II—Distribution by Census Division of the Population and Respondents to the Fourteenth Periodic Survey of Physicians

Census Division	Population		Respondents	
	No.	%	No.	%
New England	14,374	6.3%	305	6.0%
Middle Atlantic	41,495	18.1	927	18.2
East North Central	37,750	16.4	838	16.5
West North Central	15,119	6.6	346	6.8
South Atlantic	36,142	15.7	784	15.4
East South Central	11,494	5.0	252	4.9
West South Central	19,894	8.7	426	8.4
Mountain	10,997	4.8	234	4.6
Pacific	40,589	17.7	981	19.3
Total	229,781	100.0	5,093	100.0

Table III—Distribution by Age of Physician of the Population and Respondents to the Fourteenth Periodic Survey of Physicians

	Population		Respondents	
Age	No.	%	No.	%
Unknown	522	0.2%	0	0.0%
Under 35	24,295	10.6	701	13.8
35-49	97,583	42.5	1,954	38.8
50-64	76,954	33.5	1,804	35.4
65 and over	30,427	13.2	614	12.1
Total	229,781	100.0	5,093	100.0

Table IV—Distribution by Sex of Physician of the Population and Respondents to the Fourteenth Periodic Survey of Physicians

	Population		Respondents	
Sex	No.	%	No.	%
Male	214,831	93.5%	4,821	94.7%
Female	14,950	6.5	272	5.3
Total	229,781	100.0	5,093	100.0

TABLE FORMAT

Summary statistics from data collected are presented in tables that largely correspond to PSP statistics presented in previous editions of this book. Over the years, some PSP questions concerning physicians' work patterns, fees, expenses, and net incomes have changed; however, steps taken during the analyses of these data attempt to assure continuity and comparability of the data over time. New tables include previously unreported data on hours, visits, and expense differences between incorporated and not incorporated physicians.

The five characteristics employed to present the data, as in recent years, are specialty group, census division of practice, location (size of county of practice), type of practice (number of physicians in practice), and age of physician.

Nine specialty groups are obtained from the thirty-six specialties employed in the AMA's Physician Distribution and Medical Licensure series. The correspondence of the thirty-six specialties and the nine groups are:

1) General Practice (General and Family Practice);
2) Internal Medicine (Internal Medicine, Allergy, Cardiovascular Disease, Gastroenterology, and Pulmonary Disease);
3) Surgery (General Surgery, Neurological Surgery, Ophthalmology, Orthopedic Surgery, Otolaryngology, Plastic Surgery, Colon and Rectal Surgery, Thoracic Surgery, and Urology);
4) Pediatrics (Pediatrics, Pediatric Allergy, and Pediatric Cardiology);
5) Obstetrics and Gynecology;
6) Radiology (Radiology, Diagnostic Radiology, and Therapeutic Radiology);
7) Psychiatry (Psychiatry and Child Psychiatry); and
8) Anesthesiology.

The ninth specialty group, "Other," consisting of the specialties of Aerospace Medicine, Dermatology, Forensic Pathology, Neurology, Occupational Medicine, Pathology, Physical Medicine, Public Health, and General Preventive Medicine, as well as physicians practicing in other or unspecified specialties, is included in the totals only.

In the tables, the fifty states are grouped into the nine census divisions used by the Department of Commerce. The nine divisions and the states they consist of are as follows:

1) New England (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island);
2) Middle Atlantic (New York, Pennsylvania, New Jersey);
3) East North Central (Ohio, Indiana, Illinois, Michigan, Wisconsin);
4) West North Central (Minnesota, Iowa, Missouri, Kansas, Nebraska, South Dakota, North Dakota);
5) South Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida);
6) East South Central (Kentucky, Tennessee, Alabama, Mississippi);
7) West South Central (Louisiana, Arkansas, Oklahoma, Texas);
8) Mountain (Montana, Idaho, Wyoming, Nevada, Utah, Colorado, New Mexico, Arizona); and
9) Pacific (California, Oregon, Washington, Hawaii, Alaska).

Figure A is a United States map that outlines the nine census divisions described above.

Location describes the setting of the practice within three categories: nonmetropolitan areas, metropolitan areas with less than one million persons, and metropolitan areas with more than one million persons.

The type of practice is divided into four size categories:

- Solo
- 2 to 3 MDs
- 4 to 7 MDs
- 8 MDs and Over

Finally, the age of the physician is presented in six groups:

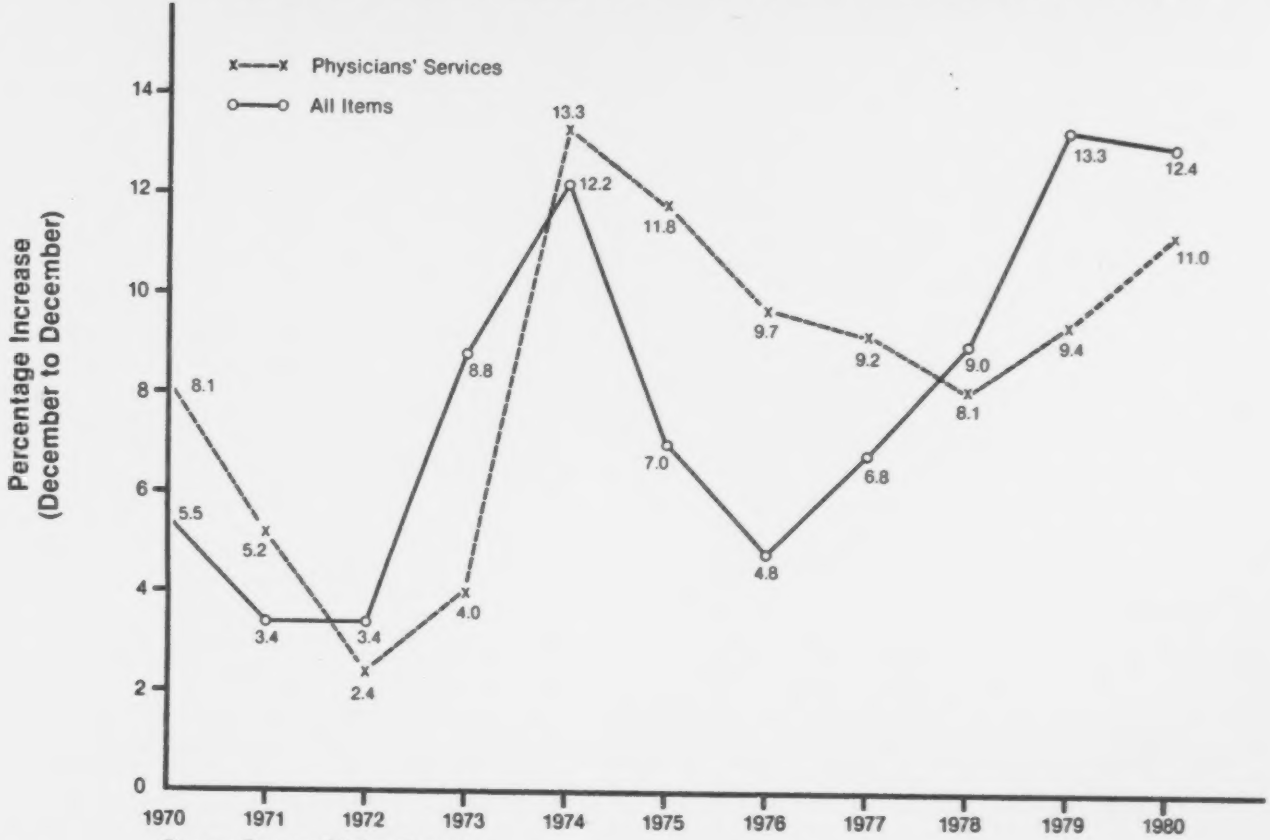
- 35 Years and Under
- 36-40 Years
- 41-45 Years
- 46-50 Years
- 51-60 Years
- 61 Years and Over

STANDARDS OF RELIABILITY

Estimates derived from the data are not presented unless they conform to the following reliability standards:

- Each estimate must be based on more than five observations; and
- the estimate must be at least twice its standard error.

Figure 2 - Percentage Increase in All Items and Physicians' Services Components of the Consumer Price Index 1970 to 1980



Source: Bureau of Labor Statistics

Physicians' Work Patterns

The average office-based physician worked 46.9 weeks in 1979.

- Obstetricians and gynecologists worked the most number of weeks in 1979 (47.5 weeks) and anesthesiologists and radiologists worked the fewest number of weeks in 1979 (46.5 weeks).
- Only anesthesiologists worked more weeks in 1979 than in 1978. All other specialty groups reported working fewer weeks in 1979 than in 1978.
- Physicians in the East North Central census division worked the fewest number of weeks (46.4 weeks) in 1979, and physicians in the South Atlantic and East South Central census divisions worked the most number of weeks (47.5 weeks) in 1979.

The average office-based physician worked 49.6 hours per week in 1980 as compared with 49.7 hours in 1979 and 50.3 hours in 1978.

- Internists worked the longest week in 1980 (52.2 hours) and psychiatrists worked the shortest week in 1980 (45.5 hours).
- In 1980, physicians in the East South Central census division worked the longest week (53.3 hours), and physicians in the Pacific census division worked the shortest week (47.9 hours).
- The average physician in a metropolitan area with a population of at least one million persons worked a shorter week (48.7 hours) than either the average physician in a metropolitan area of less than one million persons (50.1 hours) or a physician in a non-metropolitan area (51.7 hours).
- The typical physician reported working 26.3 hours per week in the office in 1980 and 16.7 hours per week in the hospital in 1980.

The typical physician had 112.0 patient visits per week in 1980, which is less than the average of 122.7 patient visits in 1979 and the average of 130.6 patient visits in 1978.

- The average radiologist had the most total patient visits per week (200.4 visits), followed by general practitioners (143.8 visits).
- The average physician in the East South Central census division had the most patient visits per week (145.6 visits) and the average physician in the Pacific census division had the fewest patient visits per week (95.8 visits).
- In 1980, the average physician in a metropolitan area of at least one million persons had 99.6 patient visits per week

which was less than 116.0 patient visits per week for the physician in a metropolitan area of less than one million persons and 144.6 patient visits per week for a physician in a non-metropolitan area.

- The average physician reported 78.7 patient visits per week in the office and 33.1 patient visits per week in the hospital in 1980.

The patient's average waiting time in the physician's office was 19.7 minutes in 1980. Also in 1980, new patients had to wait 8.1 days, on average, for an appointment for a routine visit. Established patients had to wait, on average, 4.5 days for an appointment for a routine visit.

Figure A—The United States Divided into Nine Census Divisions

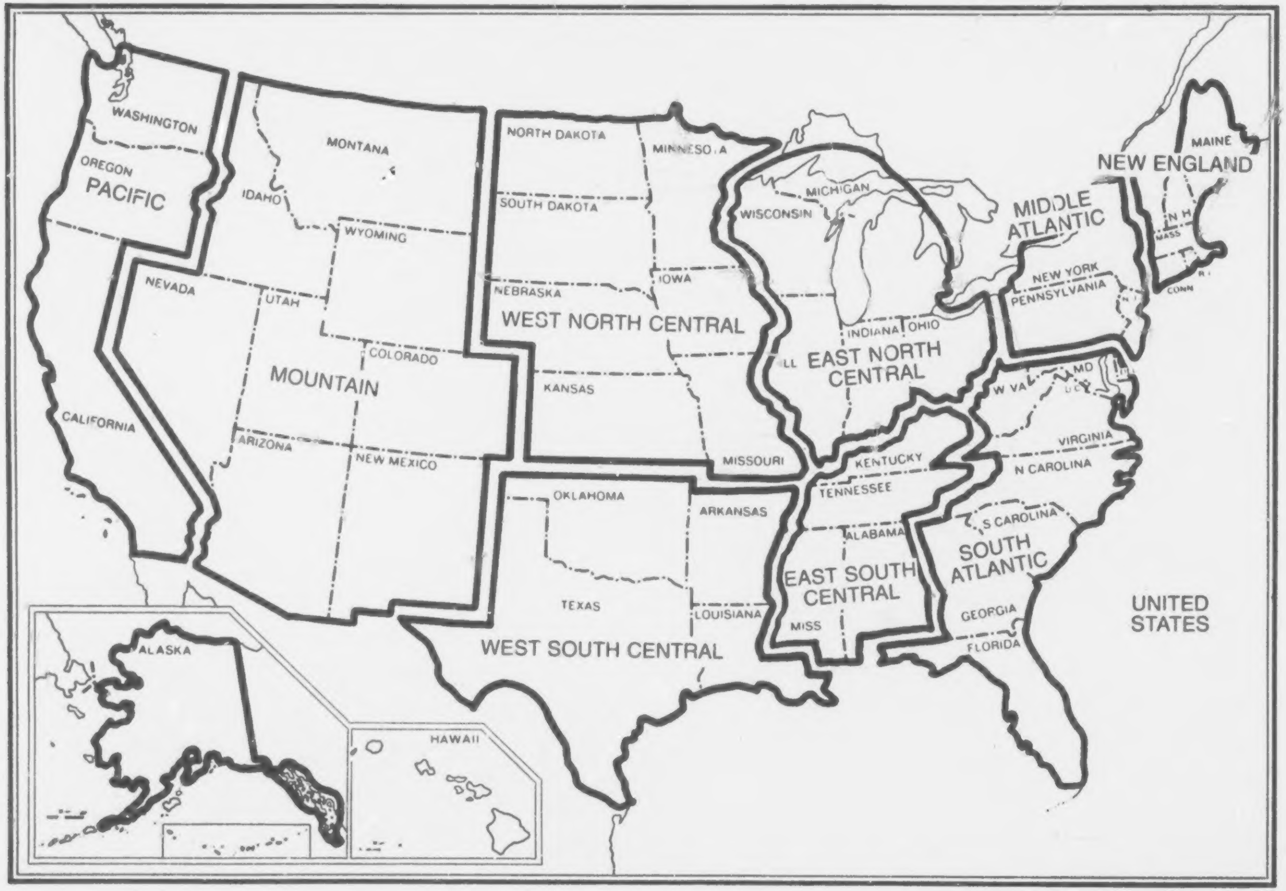


Table 1—Average Number of Weeks Practiced per Year by Specialty, 1970, 1972-1975, 1977-1979

	Year							
Specialty	1970 (N=4226)	1972 (N=4439)	1973 (N=4878)	1974 (N=5211)	1975 (N=5261)	1977 (N=4373)	1978 (N=4387)	1979 (N=5032)
Total[a]	47.5	47.2	47.2	47.2	47.2	47.0	47.4	46.9
General Practice	48.1	47.7	47.4	47.4	47.4	47.2	47.8	47.3
Internal Medicine	47.2	47.2	47.1	47.3	47.2	47.1	47.2	46.7
Surgery	47.4	46.8	46.9	47.2	46.9	47.0	47.0	46.7
Pediatrics	48.1	47.4	47.5	47.6	47.3	47.2	48.2	46.8
Obstetrics/Gynecology	48.0	47.5	47.7	47.4	47.3	47.4	47.9	47.5
Radiology	49.0	47.1	47.1	46.7	47.4	47.2	46.8	46.5
Psychiatry	46.2	47.4	47.4	47.4	47.4	46.9	47.7	47.0
Anesthesiology	46.1	46.2	46.9	46.5	46.2	45.9	45.8	46.5

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1971-1980. Center for Health Services Research and Development, American Medical Association.

Table 2—Average Number of Weeks Practiced per Year by Census Division and Specialty, 1979

Census Division	Total N	Total Mean	Specialty: Gen.Prac. (N=969)	Int.Med. (N=916)	Surg. (N=1135)	Ped. (N=329)	Ob./Gyn. (N=379)	Rad. (N=217)	Psych. (N=378)	Anes. (N=213)
			Mean							
Total[a]	5,032	46.9	47.3	46.7	46.7	46.8	47.5	46.5	47.0	46.5
New England	303	46.5	45.8	46.5	47.3	44.7	48.3	47.8	45.5	41.2
Mid. Atlantic	915	46.7	47.5	46.3	46.8	46.8	47.1	44.9	46.8	46.8
E. N. Central	829	46.4	46.3	46.9	46.7	45.4	46.4	46.6	46.7	45.8
W. N. Central	342	47.3	47.4	46.6	46.6	49.2	50.3	46.8	49.0	47.1
South Atlantic	776	47.5	47.5	47.7	47.1	48.6	47.7	46.6	47.2	47.0
E. S. Central	247	47.5	48.9	45.9	47.6	49.1	47.5	45.1	47.2	46.9
W. S. Central	417	47.4	47.8	46.6	46.7	46.6	48.5	48.2	48.4	47.9
Mountain	233	47.2	46.7	47.4	46.5	49.2	48.1	47.0	47.4	47.2
Pacific	970	46.5	47.3	46.3	45.8	45.0	47.1	46.7	46.9	46.3
			Standard Error of the Mean							
Total		.087	.210	.223	.176	.401	.232	.412	.288	.323
New England		.359	1.166	.814	.596	3.023	.437	.841	.972	4.665
Mid. Atlantic		.204	.521	.561	.323	.768	.561	1.539	.424	.555
E. N. Central		.223	.559	.440	.441	1.505	.762	.542	.913	.698
W. N. Central		.279	.628	.891	.511	.323	.541	.891	.634	.814
South Atlantic		.183	.566	.382	.369	.427	.442	.778	.734	1.017
E. S. Central		.425	.346	1.913	.750	.357	1.392	2.945	3.188	1.129
W. S. Central		.305	.622	.938	.874	1.426	.460	.728	1.247	.811
Mountain		.378	1.098	.822	.882	.373	.474	.850	1.562	.698
Pacific		.220	.480	.587	.489	1.154	.548	1.033	.697	.832

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 3—Average Number of Weeks Practiced Per Year by Type of Practice and Specialty, 1979

	Total		Specialty							
Type of Practice	N	Mean	Gen.Prac. (N=969)	Int.Med. (N=916)	Surg. (N=1135)	Ped. (N=329)	Ob./Gyn. (N=379)	Rad. (N=217)	Psych. (N=378)	Anes. (N=213)
			Mean							
Total[a]	5,032	46.9	47.3	46.7	46.7	46.8	47.5	46.5	47.0	46.5
Solo	2,452	47.3	47.6	47.0	46.9	46.8	47.9	47.8	47.6	47.4
2-3 MDs	786	47.0	47.3	46.4	46.5	47.7	47.0	48.2	46.8	47.9
4-7 MDs	521	47.0	47.4	46.7	47.0	47.8	47.4	46.4	43.3	46.9
8 MDs & Over	551	46.4	46.2	46.9	46.2	45.6	48.2	46.4	44.8	45.7
		Standard Error of the Mean								
Total		.087	.210	.223	.176	.401	.232	.412	.288	.323
Solo		.117	.242	.310	.244	.772	.348	1.346	.266	.360
2-3 MDs		.218	.590	.657	.407	.577	.446	.546	.995	1.288
4-7 MDs		.202	.573	.723	.270	.357	.390	.619	3.208	.396
8 MDs & Over		.249	.916	.410	.713	1.538	.477	.559	2.048	.637

[a] Total includes an "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 4—Average Number of Hours Practiced per Week by Specialty, 1970, 1971, 1973-1976, 1978-1980

	Year								
Specialty	1970 (N=4258)	1971 (N=4064)	1973 (N=4263)	1974 (N=4875)	1975 (N=5253)	1976 (N=5286)	1978 (N=4381)	1979 (N=4445)	1980 (N=5012)
Total[a]	51.4	53.6	50.8	49.9	51.8	52.2	50.3	49.7	49.6
General Practice	52.1	54.1	51.1	49.7	52.2	51.4	49.5	48.2	48.2
Internal Medicine	51.6	55.2	52.7	51.7	53.6	55.7	52.8	51.8	52.2
Surgery	53.2	54.6	52.4	51.9	53.7	54.4	53.2	52.7	52.0
Pediatrics	51.7	54.2	49.3	48.4	50.0	49.8	48.8	48.3	48.4
Ob./Gynecology	55.1	59.1	52.3	52.9	54.9	54.3	51.1	52.2	50.4
Radiology	47.4	48.7	47.3	47.6	45.9	48.4	47.8	47.7	47.1
Psychiatry	47.1	45.1	46.7	44.1	46.7	48.1	45.4	45.6	45.5
Anesthesiology	53.2	54.4	52.1	48.9	50.7	51.1	50.3	48.8	50.5

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1980. Center for Health Services Research and Development, American Medical Association.

Table 5—Average Number of Hours Practiced per Week by Census Division and Specialty, 1980

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=967)	Int.Med. (N=911)	Surg. (N=1131)	Ped. (N=327)	Ob./Gyn. (N=378)	Rad. (N=218)	Psych. (N=377)	Anes. (N=208)
			Mean							
Total[a]	5,012	49.6	48.2	52.2	52.0	48.4	50.4	47.1	45.5	50.5
New England	299	49.1	50.4	52.2	50.8	47.6	46.7	48.2	45.9	58.0
Mid Atlantic	916	48.2	44.4	49.1	51.3	47.8	52.5	47.9	45.1	50.5
E. N. Central	825	49.4	47.7	51.7	50.6	47.6	50.1	47.6	47.1	51.4
W. N. Central	342	52.6	53.0	56.9	54.4	49.0	56.8	48.4	50.3	45.5
South Atlantic	767	50.1	49.5	53.4	52.2	46.6	49.4	46.6	45.3	50.0
E. S. Central	248	53.3	51.9	55.6	56.2	53.3	55.6	50.3	43.4	49.8
W. S. Central	421	50.7	50.0	57.2	51.2	51.0	49.3	47.6	46.8	52.0
Mountain	230	51.5	50.5	52.4	56.9	45.2	55.3	49.1	41.3	44.5
Pacific	964	47.9	45.3	51.2	50.4	49.1	47.9	41.7	43.8	51.5
		Standard Error of the Mean								
Total		.203	.464	.480	.447	.720	.887	.660	.662	.789
New England		.798	2.454	1.686	1.811	2.734	3.251	2.651	1.906	2.978
Mid Atlantic		.484	1.359	1.072	1.030	1.646	2.432	1.351	1.339	1.447
E. N. Central		.506	1.063	1.150	1.199	1.786	2.121	1.647	1.779	2.157
W. N. Central		.725	1.279	2.560	1.558	1.709	4.757	2.138	2.621	3.681
South Atlantic		.497	1.235	1.138	.980	1.740	1.944	2.061	1.674	1.774
E. S. Central		.943	1.922	2.151	1.953	3.706	4.848	2.526	3.006	2.026
W. S. Central		.725	1.351	2.062	1.668	3.516	2.679	1.760	3.623	2.736
Mountain		.982	2.677	1.878	1.978	4.253	3.618	1.495	2.363	4.579
Pacific		.452	.950	1.071	1.067	1.233	1.912	1.905	1.525	2.024

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 6—Average Number of Hours Practiced per Week by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 774)	(N = 1696)	(N = 2542)
			Mean		
Total[a]	5,012	49.6	51.7	50.1	48.7
General Practice	967	48.2	52.3	47.4	45.4
Internal Medicine	911	52.2	53.9	53.9	50.9
Surgery	1,131	52.0	54.6	51.8	51.3
Pediatrics	327	48.4	48.8	50.0	47.2
Obstetrics/Gynecology	378	50.4	50.9	50.5	50.2
Radiology	218	47.1	47.2	47.9	46.4
Psychiatry	377	45.5	45.5	46.0	45.3
Anesthesiology	208	50.5	46.1	51.4	50.6
		Standard Error of the Mean			
Total		.203	.523	.337	.288
General Practice		.464	.806	.764	.793
Internal Medicine		.480	1.297	.899	.617
Surgery		.447	1.246	.685	.654
Pediatrics		.720	2.273	1.188	.982
Obstetrics/Gynecology		.887	2.423	1.367	1.308
Radiology		.660	2.120	.940	.963
Psychiatry		.662	1.931	1.242	.841
Anesthesiology		.789	3.144	1.203	1.071

[a] Total includes "Other" category. [b] Includes all counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] Includes all counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 7—Average Number of Hours Practiced per Week by Type of Practice and Specialty, 1980

Type of Practice	Total		Specialty								
	N	Mean	Gen.Prac. (N=967)	Int.Med. (N=911)	Surg. (N=1131)	Ped. (N=327)	Ob./Gyn. (N=378)	Rad. (N=218)	Psych. (N=377)	Anes. (N=208)
			Mean							
Total[a]	5,012	49.6	48.2	52.2	52.0	48.4	50.4	47.1	45.5	50.5
Solo	2,435	48.3	47.3	51.1	49.7	48.5	47.7	43.5	45.8	48.8
2-3 MDs	778	52.3	52.7	54.4	54.3	47.6	54.2	47.3	46.1	50.3
4-7 MDs	519	52.0	51.5	56.1	53.6	48.7	52.6	48.8	47.8	52.3
8 MDs & Over	556	51.0	48.5	53.1	53.8	50.2	51.6	48.5	48.7	51.9
		Standard Error of the Mean								
Total		.203	.464	.480	.447	.720	.887	.660	.662	.789
Solo		.307	.649	.696	.636	1.140	1.432	2.002	.841	1.386
2-3 MDs		.496	.994	1.167	.879	1.632	1.909	2.014	3.143	5.463
4-7 MDs		.561	1.267	1.861	1.234	1.523	1.771	1.206	4.069	1.588
8 MDs & Over		.473	1.412	1.034	1.265	1.431	2.118	.926	2.350	1.375

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 8—Average Number of Hours Practiced Per Week by Specialty and Corporation Status, 1980

Specialty	Total		Status	
			Not Incorporated	Incorporated
	N	Mean	(N=2427)	(N=2547)
			Mean	
Total[a]	5,012	49.6	46.5	52.6
General Practice	967	48.2	45.9	52.5
Internal Medicine	911	52.2	48.9	55.6
Surgery	1,131	52.0	47.6	54.3
Pediatrics	327	48.4	48.1	48.9
Obstetrics/Gynecology	378	50.4	46.5	52.4
Radiology	218	47.1	46.7	47.2
Psychiatry	377	45.5	43.0	50.9
Anesthesiology	208	50.5	48.2	51.3
		Standard Error of the Mean		
Total		.203	.291	.271
General Practice		.466	.578	.735
Internal Medicine		.483	.642	.690
Surgery		.447	.772	.528
Pediatrics		.724	.980	1.056
Obstetrics/Gynecology		.887	1.853	.934
Radiology		.663	1.470	.680
Psychiatry		.664	.801	1.033
Anesthesiology		.789	1.501	.921

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 9—Average Number of Hours of Direct Patient Care per Week by Specialty, 1970, 1971, 1973-1976, 1978-1980

	Year								
Specialty	1970 (N=4374)	1971 (N=3478)	1973 (N=4215)	1974 (N=4796)	1975 (N=5246)	1976 (N=5203)	1978 (N=4324)	1979 (N=4272)	1980 (N=4946)
Total[a]	44.7	46.3	46.1	44.5	47.5	46.5	45.4	44.9	44.5
General Practice	47.7	49.6	47.6	45.5	49.0	46.5	45.8	45.0	44.5
Internal Medicine	45.5	49.7	47.5	46.2	49.2	49.3	47.8	47.2	47.4
Surgery	47.2	44.3	47.8	46.3	48.9	47.9	48.2	46.9	46.5
Pediatrics	45.9	48.5	44.5	44.2	46.1	44.9	44.5	43.5	43.8
Ob./Gynecology	49.9	46.6	48.8	48.1	51.6	49.4	47.3	47.8	45.9
Radiology	34.5	40.1	41.8	41.4	41.9	44.5	43.9	43.7	41.7
Psychiatry	37.3	38.6	40.3	37.3	41.0	41.3	38.2	39.6	38.8
Anesthesiology	46.8	43.9	48.0	44.7	47.2	47.2	46.6	44.5	46.5

[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1980. Center for Health Services Research and Development, American Medical Association.

Table 10—Average Number of Hours of Direct Patient Care per Week by Census Division and Specialty, 1980

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=959)	Int.Med. (N=901)	Surg. (N=1111)	Ped. (N=324)	Ob./Gyn. (N=372)	Rad. (N=213)	Psych. (N=368)	Anes. (N=206)
			Mean							
Total[a]	4,946	44.5	44.5	47.4	46.5	43.8	45.9	41.7	38.8	46.5
New England	294	42.9	45.4	46.7	44.3	43.3	43.4	35.3	33.9	53.2
Mid. Atlantic	896	42.8	41.9	44.2	44.8	42.3	47.0	40.3	38.7	45.1
E. N. Central	815	44.1	43.2	47.2	44.5	43.5	46.1	42.2	41.5	46.5
W. N. Central	337	48.4	50.6	51.0	51.0	45.5	56.5	44.4	45.8	42.3
South Atlantic	759	45.1	45.4	49.3	46.7	41.3	44.8	41.2	37.5	45.4
E. S. Central	247	48.6	48.4	50.9	51.3	50.4	49.8	46.5	43.1	45.2
W. S. Central	418	45.8	45.7	52.4	46.4	47.3	44.9	43.0	40.1	45.8
Mountain	227	46.7	45.0	48.8	51.9	42.5	50.2	43.6	36.5	40.9
Pacific	953	43.1	41.7	45.8	45.3	44.3	43.9	39.6	37.6	51.1
		Standard Error of the Mean								
Total		.208	.472	.484	.447	.766	.822	.757	.671	.860
New England		.821	3.136	1.556	1.522	3.372	3.220	3.854	2.270	2.664
Mid Atlantic		.472	1.319	1.053	1.044	1.913	1.683	1.873	1.185	1.528
E. N. Central		.526	1.068	1.262	1.170	2.028	2.072	2.034	1.722	2.429
W. N. Central		.770	1.322	2.593	1.531	1.764	2.786	1.814	2.827	4.380
South Atlantic		.499	1.166	1.167	1.027	1.677	1.867	1.875	1.694	1.784
E. S. Central		1.008	2.231	2.640	1.968	3.644	4.850	3.014	3.272	2.055
W. S. Central		.732	1.376	1.888	1.626	3.193	2.827	2.027	4.108	3.589
Mountain		1.048	2.871	1.875	1.959	3.962	4.927	3.400	3.100	4.891
Pacific		.463	.968	1.040	1.078	1.378	1.833	2.010	1.462	2.097

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 11—Average Number of Hours of Direct Patient Care per Week by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 763)	(N = 1672)	(N = 2511)
			Mean		
Total[a]	4,946	44.5	47.5	45.3	43.1
General Practice	959	44.5	43.6	43.3	42.0
Internal Medicine	901	47.4	50.2	48.8	46.1
Surgery	1,111	46.5	50.1	46.9	45.1
Pediatrics	324	43.8	46.6	46.7	41.4
Obstetrics/Gynecology	372	45.9	47.9	47.4	44.5
Radiology	213	41.7	43.4	43.1	39.9
Psychiatry	368	38.8	37.7	40.5	38.2
Anesthesiology	206	46.5	42.6	47.4	46.6
			Standard Error of the Mean		
Total		.208	.555	.352	.286
General Practice		.472	.850	.804	.758
Internal Medicine		.484	1.276	.911	.621
Surgery		.447	1.301	.683	.642
Pediatrics		.766	2.350	1.259	1.028
Obstetrics/Gynecology		.822	2.430	1.312	1.159
Radiology		.757	1.765	1.219	1.128
Psychiatry		.671	1.838	1.358	.823
Anesthesiology		.860	2.585	1.173	1.269

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 12—Average Number of Office Hours per Week by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 755)	(N = 1651)	(N = 2470)
			Mean		
Total[a]	4,876	26.3	29.2	26.1	25.6
General Practice	974	33.8	35.7	33.1	32.9
Internal Medicine	914	27.9	30.1	28.3	27.4
Surgery	1,133	22.3	23.4	22.4	21.9
Pediatrics	322	35.2	35.3	36.2	34.5
Obstetrics/Gynecology	377	28.9	30.2	28.9	28.7
Radiology	162	11.9	12.2	12.8	11.0
Psychiatry	373	29.6	24.4	28.2	30.7
		Standard Error of the Mean			
Total		.200	.471	.347	.285
General Practice		.327	.539	.550	.586
Internal Medicine		.375	1.021	.639	.512
Surgery		.342	.787	.564	.508
Pediatrics		.657	1.439	1.306	.806
Obstetrics/Gynecology		.483	1.201	.831	.678
Radiology		1.317	3.558	2.031	1.998
Psychiatry		.665	2.864	1.241	.811

[a] Total includes Anesthesiology and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 13—Average Number of Hospital Hours per Week by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 753)	(N = 1656)	(N = 2468)
				Mean	
Total[a]	4,877	16.7	17.9	17.2	16.0
General Practice	958	11.3	13.7	10.5	9.7
Internal Medicine	903	18.1	18.6	19.3	17.4
Surgery	1,111	20.8	23.5	20.8	19.8
Pediatrics	321	9.9	10.9	10.2	9.5
Obstetrics/Gynecology	379	15.9	15.7	16.3	15.8
Radiology	193	23.8	30.4	23.9	21.7
Psychiatry	345	10.6	16.5	13.0	8.8
Anesthesiology	206	33.0	29.2	32.0	34.1
			Standard Error of the Mean		
Total		.223	.543	.383	.316
General Practice		.308	.610	.522	.449
Internal Medicine		.464	1.154	.817	.630
Surgery		.487	1.344	.773	.701
Pediatrics		.539	1.245	.939	.741
Obstetrics/Gynecology		.631	2.226	1.100	.796
Radiology		1.513	3.748	2.469	2.198
Psychiatry		.632	2.950	1.142	.752
Anesthesiology		1.511	4.458	2.616	2.027

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 14—Average Number of Total Patient Visits per Week by Specialty, 1970, 1971, 1973-1976, 1978-1980

Specialty	Year 1970 (N=4342)	 1971 (N=3860)	 1973 (N=3026)	 1974 (N=4479)	 1975 (N=5151)	 1976 (N=4551)	 1978 (N=1824)	 1979 (N=3755)	 1980 (N=4388)
Total[a]	132.5	135.8	137.7	125.8	126.5	128.5	130.6	122.7	112.0
General Practice	172.9	171.5	189.9	174.4	177.2	167.8	180.0	157.7	143.8
Internal Medicine	122.6	127.2	127.2	126.3	124.7	124.3	118.6	117.5	106.0
Surgery	122.2	123.4	129.5	119.6	119.6	122.2	110.8	115.9	101.0
Pediatrics	145.2	163.4	158.1	152.5	140.2	146.1	148.1	138.9	141.9
Ob./Gynecology	132.8	125.6	132.4	130.7	131.8	133.2	126.2	126.0	113.3
Radiology	233.9	199.6	166.8	134.9	138.4	207.1	209.6	193.0	200.4
Psychiatry	54.6	46.5	52.2	46.7	48.3	50.6	54.4	57.2	48.9
Anesthesiology	48.4	57.8	42.6	32.0	33.0	33.8	43.2	31.0	40.9

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[a] Physicians whose specialties were classified as "Other" or "Not Specified" are included in this total.

Source: Periodic Survey of Physicians, 1970-1980. Center for Health Services Research and Development, American Medical Association.

Table 15—Average Number of Total Patient Visits per Week by Census Division and Specialty, 1980

Census Division	Total		Specialty							
	N	Mean	Gen.Prac. (N=892)	Int.Med. (N=827)	Surg. (N=1032)	Ped. (N=315)	Ob./Gyn. (N=344)	Rad. (N=97)	Psych. (N=351)	Anes. (N=161)
			Mean							
Total[a]	4,388	112.0	143.8	106.0	101.0	141.9	113.3	200.4	48.9	40.9
New England	271	97.9	111.4	104.5	91.3	163.0	90.9	167.9	44.3	b
Mid Atlantic	793	102.8	134.3	96.9	96.0	127.7	114.5	232.3	45.0	35.8
E. N. Central	709	118.8	140.4	113.3	106.4	151.9	122.5	269.4	56.6	42.1
W. N. Central	285	130.0	171.1	116.8	114.7	132.9	100.1	b	63.6	36.1
South Atlantic	692	114.7	146.7	109.9	105.2	145.8	110.1	230.1	42.6	36.9
E. S. Central	215	145.6	190.9	138.4	127.8	182.3	153.1	187.7	67.6	49.8
W. S. Central	368	129.3	164.0	117.0	107.7	171.1	113.6	150.1	72.7	47.0
Mountain	203	109.0	141.7	102.3	101.9	113.5	112.9	b	56.8	26.0
Pacific	852	95.8	117.7	96.7	83.2	127.6	105.3	158.6	41.5	44.7
		Standard Error of the Mean								
Total		1.158	2.651	2.121	1.785	3.762	3.270	16.750	1.770	4.055
New England		3.877	9.997	8.960	5.665	23.346	11.360	31.203	4.683	b
Mid Atlantic		2.784	8.150	4.430	4.110	8.263	7.246	55.550	2.840	2.651
E. N. Central		3.169	5.795	5.395	5.000	11.914	8.345	76.184	6.152	7.470
W. N. Central		5.066	8.517	9.774	8.003	13.542	25.292	b	9.515	4.111
South Atlantic		2.964	6.748	4.901	4.589	8.207	7.761	52.317	2.732	5.197
E. S. Central		5.939	16.571	14.789	6.209	13.439	23.176	42.691	13.212	9.525
W. S. Central		4.182	8.172	9.479	8.482	11.276	9.700	25.849	15.112	9.297
Mountain		4.387	11.324	7.121	6.064	14.273	13.955	b	7.348	3.350
Pacific		2.018	3.898	4.377	3.136	7.612	5.704	16.336	2.473	17.042

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 16—Average Number of Total Patient Visits per Week by Specialty and Location, 1980

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
	N	Mean	(N = 676)	Less than 1,000,000[b] (N = 1450)	1,000,000 and over[c] (N = 2262)
				Mean	
Total[a]	4,388	112.0	144.6	116.0	99.6
General Practice	892	143.8	172.6	137.3	124.1
Internal Medicine	827	106.0	136.2	111.9	97.6
Surgery	1,032	101.0	116.6	104.8	93.7
Pediatrics	315	141.9	151.0	155.9	131.4
Obstetrics/Gynecology	344	113.3	131.5	118.9	105.7
Radiology	97	200.4	255.1	219.7	163.5
Psychiatry	351	48.9	60.4	60.2	43.2
Anesthesiology	161	40.9	32.9	47.2	38.8
				Standard Error of the Mean	
Total		1.158	3.346	1.979	1.494
General Practice		2.651	5.292	4.071	3.937
Internal Medicine		2.121	7.702	3.995	2.502
Surgery		1.785	5.013	2.933	2.456
Pediatrics		3.762	12.281	6.428	4.889
Obstetrics/Gynecology		3.270	10.413	6.154	3.944
Radiology		16.750	39.163	33.064	19.152
Psychiatry		1.770	7.201	4.749	1.545
Anesthesiology		4.055	4.290	4.740	6.564

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 17—Average Number of Total Patient Visits per Week by Type of Practice and Specialty, 1980

	Total		Specialty							
Type of Practice	N	Mean	Gen.Prac. (N=892)	Int.Med. (N=827)	Surg. (N=1032)	Ped. (N=315)	Ob./Gyn. (N=344)	Rad. (N=97)	Psych. (N=351)	Anes. (N=161)
			Mean							
Total[a]	4,388	112.0	143.8	106.0	101.0	141.9	113.3	200.4	48.9	40.9
Solo	2,196	104.8	138.6	102.2	94.7	144.8	97.7	175.1	48.2	40.2
2-3 MDs	701	129.9	164.1	111.3	108.6	149.8	128.2	269.1	50.4	b
4-7 MDs	428	130.8	150.8	119.8	120.3	150.2	131.5	242.2	77.1	45.6
8 MDs & Over	450	113.0	143.9	109.9	104.6	150.9	120.6	189.8	50.1	39.8
		Standard Error of the Mean								
Total		1.158	2.651	2.121	1.785	3.762	3.270	16.750	1.770	4.055
Solo		1.550	3.623	2.975	2.418	6.421	4.628	33.338	1.901	8.245
2-3 MDs		2.982	6.613	5.407	3.937	8.092	7.147	43.445	4.128	b
4-7 MDs		4.171	7.620	6.990	6.072	10.008	10.136	48.097	15.971	7.076
8 MDs & Over		3.017	6.985	4.497	5.327	11.260	8.981	24.511	6.897	4.129

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Physicians' Fees

For all six specialties reported, fees for an initial office visit rose in 1980 from 1979 levels by the following percentages:

- General Practice—12.2%
- Obstetrics/Gynecology—10.8%
- Surgery—9.6%
- Psychiatry—9.4%
- Pediatrics—5.2%
- Internal Medicine—5.2%

The location of the practice appears to be related to physicians' average fees. Physicians in nonmetropolitan areas had the lowest average fee for an initial office visit ($21.85). Physicians in metropolitan areas with more than one million persons had the highest average fee for an initial office visit ($38.92).

The following points are of interest concerning physicians' average fees when examined by census division in 1980:

- The average initial office visit fee was highest in the Pacific census division ($40.99) and lowest in the West North Central census division ($25.24).
- The average fee for a follow-up office visit was highest in the Pacific census division ($25.15) and lowest in the East South Central census division ($16.28).
- The average fee for a follow-up hospital visit was highest in the Pacific census division ($34.72) and lowest in the East South Central census division ($22.03).
- The average fee for an appendectomy was highest in the Pacific census division ($527.94) and lowest in the East South Central census division ($339.23).
- The average fee for an annual examination was highest in the Pacific census division ($50.08) and lowest in the East South Central division ($30.95).

Table 18—Average Number of Total Patient Visits per Week by Specialty and Corporation Status, 1980

Specialty	Total		Status	
			Not Incorporated	Incorporated
	N	Mean	(N=2155)	(N=2204)
			Mean	
Total[a]	4,388	112.2	100.5	123.5
General Practice	892	143.8	130.4	167.6
Internal Medicine	827	106.0	91.3	122.1
Surgery	1,032	101.1	85.3	109.7
Pediatrics	315	141.9	128.0	164.3
Obstetrics/Gynecology	344	113.3	92.8	123.2
Radiology	97	200.4	189.2	209.6
Psychiatry	351	48.9	45.0	57.2
Anesthesiology	161	40.9	51.3	37.0
		Standard Error of the Mean		
Total		1.163	1.596	1.656
General Practice		2.666	3.057	4.740
Internal Medicine		2.134	2.586	3.255
Surgery		1.786	2.905	2.190
Pediatrics		3.781	4.818	5.571
Obstetrics/Gynecology		3.270	5.133	4.017
Radiology		17.040	33.409	19.073
Psychiatry		1.782	2.224	2.826
Anesthesiology		4.055	13.344	2.428

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 19—Average Number of Office Visits per Week by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 773)	(N = 1593)	(N = 2425)
			Mean		
Total[a]	4,751	78.7	103.1	79.8	70.5
General Practice	960	116.5	133.5	113.6	104.5
Internal Medicine	891	66.3	85.6	68.7	61.4
Surgery	1,100	69.9	80.4	73.7	63.9
Pediatrics	320	125.2	132.7	133.2	118.7
Obstetrics/Gynecology	374	96.4	108.6	101.5	89.9
Radiology	157	45.6	59.2	35.5	49.8
Psychiatry	364	33.2	35.7	33.8	32.7
		Standard Error of the Mean			
Total		.943	2.472	1.505	1.333
General Practice		2.071	3.929	3.154	3.468
Internal Medicine		1.378	4.675	2.458	1.724
Surgery		1.374	3.314	2.390	1.906
Pediatrics		3.495	8.197	6.330	4.649
Obstetrics/Gynecology		2.366	6.887	4.333	2.968
Radiology		8.578	27.117	9.117	14.120
Psychiatry		1.035	5.479	2.511	1.038

[a] Total includes Anesthesiology and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 20—Average Number of Hospital Visits per Week by Specialty and Location, 1980

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
	N	Mean	(N = 738)	Less than 1,000,000[b] (N = 1584)	1,000,000 and over[c] (N = 2383)
			Mean		
Total[a]	4,705	33.1	43.5	35.5	28.2
General Practice	927	27.0	37.5	24.8	19.5
Internal Medicine	882	40.0	53.0	43.5	35.7
Surgery	1,080	36.5	46.9	37.3	32.6
Pediatrics	315	18.2	23.2	20.3	16.0
Obstetrics/Gynecology	367	23.8	25.5	25.0	22.5
Radiology	172	76.7	133.7	98.0	43.5
Psychiatry	321	16.3	27.5	24.3	11.6
Anesthesiology	196	35.7	29.9	36.8	35.9
		Standard Error of the Mean			
Total		.712	2.044	1.376	.846
General Practice		1.007	2.220	1.668	1.135
Internal Medicine		1.393	4.545	2.517	1.768
Surgery		1.274	4.358	1.865	1.706
Pediatrics		1.164	3.597	1.914	1.588
Obstetrics/Gynecology		1.239	3.182	2.233	1.664
Radiology		11.086	33.872	22.720	9.663
Psychiatry		1.372	6.533	3.369	1.237
Anesthesiology		3.522	4.207	4.295	5.593

[a] Total includes "Other" category. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 21—Average Waiting Time for Appointment and in Office by Specialty, 1980

	Waiting Time		
	In Office (in minutes)	For Appointment (in days)	
Specialty	(N=4529)	New Patient (N=4445)	Established Patient (N=4421)
	Mean		
Total[a]	19.7	8.1	4.5
General Practice	23.7	3.9	2.1
Internal Medicine	19.0	11.1	3.9
Surgery	21.4	8.9	5.7
Pediatrics	21.5	7.8	5.1
Obstetrics/Gynecology	22.6	13.2	11.1
Radiology	18.1	1.3	.7
Psychiatry	5.3	8.8	3.1
Anesthesiology	9.2	b	.8
	Standard Error of the Mean		
Total	.224	.257	.149
General Practice	.532	.253	.137
Internal Medicine	.488	.762	.282
Surgery	.443	.517	.367
Pediatrics	.781	.683	.604
Obstetrics/Gynecology	.641	.961	.804
Radiology	1.018	.249	.112
Psychiatry	.451	1.166	.213
Anesthesiology	2.033	b	.295

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 22—Average Waiting Time for Appointment and in Office by Location, 1980

	Waiting Time		
	In Office (in minutes)	For Appointment (in days)	
		New Patient	Established Patient
Location	(N=4529)	(N=4445)	(N=4421)
	Mean		
Total	19.7	8.1	4.5
Nonmetropolitan	22.8	8.7	4.6
Metropolitan:			
Less than 1,000,000[a]	20.0	9.1	4.8
1,000,000 and over[b]	18.5	7.3	4.2
	Standard Error of the Mean		
Total	.224	.257	.149
Nonmetropolitan	.590	.914	.497
Metropolitan:			
Less than 1,000,000	.382	.488	.280
1,000,000 and over	.310	.267	.166

[a] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs.

[b] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development American Medical Association.

Table 23—Average Fee for Initial Office Visit by Specialty, 1970, 1971, 1973-1976, 1978-1980[a]

Specialty	Year								
	1970	1971	1973	1974	1975	1976	1978	1979	1980
General Practice	$ 8.46	$ 9.65	$10.74	$12.03	$13.11	$14.80	$16.55	$18.21	$20.43
Internal Medicine	17.81	20.38	20.51	23.11	26.11	31.27	32.53	38.18	40.18
Surgery	14.72	16.43	17.69	18.87	20.81	23.29	26.52	29.04	31.83
Pediatrics	9.95	11.18	12.20	14.49	16.18	17.45	19.03	21.06	22.15
Obstetrics/Gynecology	14.23	17.59	19.68	22.07	23.57	27.41	29.85	30.70	34.03
Psychiatry	32.64	35.58	37.51	41.39	44.61	50.15	54.63	56.80	62.13

[a] An initial office visit is defined as "office visit, new patient, brief evaluation, history, examination and/or treatment."

Source: Periodic Survey of Physicians, 1970-1980. Center for Health Services Research and Development, American Medical Association.

Table 24—Average Fee for Initial Office Visit by Census Division and Specialty, 1980

Census Division	Total		Specialty					
	N	Mean	General Practice (N=884)	Internal Medicine (N=786)	Surgery (N=1073)	Pediatrics (N=275)	Obstetrics/ Gynecology (N=356)	Psychiatry (N=299)
			Mean					
Total[a]	3,960	$33.28	$20.43	$40.18	$31.83	$22.15	$34.03	$62.13
New England	244	34.91	18.56	37.46	33.07	17.40	32.87	59.39
Middle Atlantic	733	36.06	18.77	41.83	37.02	23.55	34.40	60.37
East North Central	663	29.32	19.41	34.60	26.89	18.95	30.10	61.35
West North Central	270	25.24	16.38	35.19	22.36	20.06	29.73	58.31
South Atlantic	636	33.21	21.89	39.59	30.88	22.24	34.57	61.17
East South Central	195	26.61	18.48	38.46	24.97	20.47	27.71	61.67
West South Central	341	30.34	18.56	45.04	29.60	22.00	29.94	69.27
Mountain	186	29.98	21.54	34.79	27.59	21.78	27.71	b
Pacific	692	40.99	26.12	47.75	40.09	26.87	43.90	66.59
			Standard Error of the Mean					
Total		.340	.264	.951	.544	.487	.749	.955
New England		1.276	1.107	2.684	2.261	1.218	2.454	2.107
Middle Atlantic		.827	.512	1.971	1.475	1.028	1.613	1.936
East North Central		.677	.581	1.742	.832	.888	1.402	2.830
West North Central		1.009	.523	3.104	1.277	1.434	3.409	3.514
South Atlantic		.743	.858	1.934	1.172	1.583	1.315	1.729
East South Central		1.029	.972	3.249	1.500	1.061	2.276	1.054
West South Central		1.417	.577	7.881	1.591	.989	1.413	4.062
Mountain		1.431	1.282	4.304	1.639	2.247	1.793	b
Pacific		.937	.647	2.405	1.683	1.473	2.717	2.663

[a]Total includes Radiology, Anesthesiology, and "Other" categories. [b]Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 25—Average Fee for Initial Office Visit by Specialty and Location, 1980

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
				Less than 1,000,000[b]	1,000,000 and over[c]
	N	Mean	(N = 648)	(N = 1350)	(N = 1962)
			Mean		
Total[a]	3,960	$33.28	$21.85	$30.57	$38.92
General Practice	884	20.43	17.62	20.69	22.63
Internal Medicine	786	40.18	29.64	37.22	44.10
Surgery	1,073	31.83	22.33	28.29	37.63
Pediatrics	275	22.15	18.84	19.87	24.44
Obstetrics/Gynecology	356	34.03	26.64	30.79	38.38
Psychiatry	299	62.13	49.70	59.63	63.86
		Standard Error of the Mean			
Total		.340	.460	.478	.547
General Practice		.264	.421	.424	.465
Internal Medicine		.951	2.155	1.333	1.421
Surgery		.544	.627	.686	.913
Pediatrics		.487	.879	.617	.757
Obstetrics/Gynecology		.749	1.242	.869	1.226
Psychiatry		.955	4.318	1.461	1.229

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 26—Average Fee for Follow-up Office Visit by Specialty, 1971, 1973-1976, 1978-1980[a]

Specialty	Year 1971	1973	1974	1975	1976	1978	1979	1980
General Practice	$ 6.93	$ 7.52	$ 8.75	$ 9.29	$10.65	$12.15	$13.67	$15.18
Internal Medicine	9.96	11.13	12.28	13.56	15.52	16.83	19.89	20.46
Surgery	9.18	10.34	11.27	12.22	13.94	15.91	17.61	19.00
Pediatrics	7.89	8.65	10.38	11.07	12.52	13.72	15.65	16.40
Obstetrics/Gynecology	9.52	11.53	13.10	13.73	15.40	18.23	19.04	20.66

[a] A follow-up office visit is defined as "office visit, established patient, brief examination, evaluation and/or treatment, same or new illness."

Source: Periodic Survey of Physicians, 1971-1980. Center for Health Services Research and Development, American Medical Association.

Table 27—Average Fee for Follow-up Office Visit by Census Division and Specialty, 1980

Census Division	Total N	Total Mean	Specialty Gen.Prac. (N=884)	Int.Med. (N=818)	Surg. (N=1059)	Ped. (N=276)	Ob./Gyn. (N=354)	Psych. (N=278)
		Mean						
Total[a]	3,948	$20.96	$15.18	$20.46	$19.00	$16.40	$20.66	$53.62
New England	244	24.02	14.63	21.09	21.10	15.43	21.22	53.81
Middle Atlantic	728	23.26	14.99	21.93	22.52	17.30	21.70	53.63
East North Central	661	18.89	14.20	18.63	17.13	15.10	18.02	50.70
West North Central	267	16.40	12.71	17.09	14.26	15.00	17.60	46.63
South Atlantic	633	20.19	15.77	20.37	17.57	16.22	20.67	51.00
East South Central	196	16.28	12.91	18.52	15.75	15.74	16.50	b
West South Central	337	18.86	14.05	19.00	17.76	15.96	17.66	61.57
Mountain	186	17.52	15.67	18.47	16.29	15.27	16.29	b
Pacific	696	25.15	18.84	22.85	22.31	18.42	26.56	58.50
		Standard Error of the Mean						
Total		.205	.140	.247	.330	.200	.540	.969
New England		.901	.625	1.186	.966	.562	1.673	1.842
Middle Atlantic		.496	.341	.596	.680	.508	1.071	2.189
East North Central		.427	.239	.595	.497	.380	.861	2.457
West North Central		.577	.259	.854	.458	.667	1.933	3.839
South Atlantic		.419	.362	.541	.475	.543	.866	2.368
East South Central		.498	.415	.905	.602	.323	1.593	b
West South Central		.639	.288	.627	.639	.488	.854	4.502
Mountain		.535	.817	.713	.830	1.153	1.188	b
Pacific		.652	.388	.528	1.483	.438	2.246	2.090

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 28—Average Fee for Follow-up Office Visit by Specialty and Location, 1980

	Total		Location		
			Nonmetropolitan	Metropolitan	
Specialty	N	Mean	(N = 647)	Less than 1,000,000[b] (N = 1349)	1,000,000 and over[c] (N = 1952)
			Mean		
Total[a]	3,948	$20.96	$14.59	$18.90	$24.50
General Practice	848	15.18	12.99	15.13	17.11
Internal Medicine	818	20.46	15.52	18.86	22.41
Surgery	1,059	19.00	14.84	16.70	22.18
Pediatrics	276	16.40	14.94	15.17	17.56
Obstetrics/Gynecology	354	20.66	15.89	18.60	23.42
Psychiatry	278	53.62	40.20	48.60	56.46
		Standard Error of the Mean			
Total		.205	.221	.271	.343
General Practice		.140	.167	.205	.264
Internal Medicine		.247	.422	.302	.369
Surgery		.330	.344	.280	.622
Pediatrics		.200	.514	.232	.296
Obstetrics/Gynecology		.540	.754	.461	.956
Psychiatry		.969	6.603	1.721	1.123

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 29—Average Fee for Follow-up Hospital Visit by Census Division and Specialty, 1980[a]

Census Division	Total		Specialty					
	N	Mean	Gen.Prac. (N=777)	Int.Med. (N=777)	Surg. (N=931)	Ped. (N=260)	Ob./Gyn. (N=296)	Psych. (N=179)
		Mean						
Total[b]	3,444	$28.22	$21.84	$27.93	$28.92	$22.61	$27.69	$55.53
New England	200	27.06	18.09	25.85	27.38	19.07	26.75	49.44
Middle Atlantic	581	31.04	20.47	28.15	37.06	23.93	30.89	56.27
East North Central	593	26.01	19.53	24.19	27.34	21.08	24.98	63.57
West North Central	244	22.32	16.45	24.46	21.90	19.00	25.13	47.00
South Atlantic	554	28.20	21.41	28.99	28.12	26.48	27.43	47.65
East South Central	175	22.03	21.34	27.14	20.84	17.06	16.80	46.67
West South Central	303	25.23	20.10	24.98	28.86	20.92	25.77	45.63
Mountain	169	24.05	22.24	26.00	24.69	20.00	15.92	c
Pacific	625	34.72	31.31	34.13	30.72	25.16	34.84	63.69
		Standard Error of the Mean						
Total		.418	.907	.614	.920	.753	.940	2.293
New England		1.316	1.137	1.417	2.257	1.477	2.923	5.031
Middle Atlantic		1.381	.980	1.289	4.374	1.505	2.728	4.027
East North Central		.815	.812	1.068	1.459	1.759	1.521	9.416
West North Central		.968	.839	2.584	1.382	1.174	3.696	6.116
South Atlantic		.769	.963	1.923	1.323	2.942	1.762	2.925
East South Central		.908	1.865	2.820	1.218	.615	1.768	7.601
West South Central		.855	.960	1.790	2.156	1.811	1.859	7.585
Mountain		1.040	2.061	2.541	1.983	1.926	1.276	c
Pacific		1.352	4.854	1.733	1.556	1.946	3.125	4.676

[a] A follow-up hospital visit is defined as a "hospital visit, new or established patient, brief examination, evaluation and/or treatment, same illness." [b] Total includes Radiology, Anesthesiology and "Other" categories. [c] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 30—Average Fee for Follow-up Hospital Visit by Specialty and Location, 1980

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N = 584)	(N = 1188)	(N = 1672)
				Mean	
Total[a]	3,444	$28.22	$20.77	$25.48	$32.78
General Practice	777	21.84	18.09	20.72	26.22
Internal Medicine	777	27.93	22.70	26.62	29.77
Surgery	931	28.92	23.49	25.59	33.48
Pediatrics	260	22.61	18.38	18.64	26.07
Obstetrics/Gynecology	296	27.69	21.12	24.75	31.76
Psychiatry	179	55.53	33.56	47.27	61.20
				Standard Error of the Mean	
Total		.418	.480	.454	.763
General Practice		.907	.531	.648	2.408
Internal Medicine		.614	1.637	.967	.872
Surgery		.920	1.042	.810	1.808
Pediatrics		.753	1.938	.641	1.203
Obstetrics/Gynecology		.940	1.446	1.211	1.558
Psychiatry		2.293	6.594	2.807	3.139

[a] Total includes Radiology, Anesthesiology, and "Other" categories. [b] Includes counties in SMSAs with 50,000 to 999,999 inhabitants and counties considered potential SMSAs. [c] Includes counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Physicians' Professional Expenses

For the average physician, professional expenses rose by an annual rate of 9.0% from 1970 to 1979. The annual percentage increases in professional expenses from 1970 to 1979 were, by specialty:

Specialty	1970-1979
• Surgery	11.0
• Obstetrics/Gynecology	10.3
• Anesthesiology	9.9
• General Practice	9.7
• Internal Medicine	8.6
• Pediatrics	8.3
• Psychiatry	6.3

The following comments about the pattern of professional expenses in 1979 are of interest:

- The average surgeon had the highest professional expenses in 1979 ($69,300).
- The average pyschiatrist had the lowest professional expenses in 1979 ($23,100).
- Physicians in the East South Central census division had the highest professional expenses in 1979 ($66,000). Physicians in the New England census division had the lowest professional expense in 1979 ($38,000).

Examination of selected categories of average professional expenses in 1979 reveals that the largest category is nonphysician payroll ($19,368), followed by office expenses ($11,655), professional liability insurance ($4,785), and medical equipment ($4,700). Other points of interest concerning selected professional expenses are the following:

- Anesthesiologists had the highest professional liability insurance expense ($9,731) while psychiatrists had the lowest ($1,247).
- Physicians in the Pacific census division had the highest mean professional liability insurance expense ($6,866) and those in the New England census division had the lowest ($2,986).
- Surgeons had the highest average nonphysician payroll expense ($23,773) and psychiatrists had the lowest nonphysician payroll expense ($5,769).

Table 31—Average Fee for Appendectomy by Census Division and Specialty, 1980

	Total		Specialty		
Census Division	N	Mean	General Practice (N=191)	Surgery (N=355)	Ob./Gyn. (N=67)
				Mean	
Total[a]	664	$407.32	$359.57	$463.20	$402.57
New England	22	390.32	b	363.56	461.67
Mid Atlantic	79	470.87	b	521.37	421.43
East North Central	123	367.96	321.71	423.26	b
West North Central	85	346.07	323.16	384.22	315.00
South Atlantic	89	388.95	342.29	437.79	b
East South Central	39	339.23	298.33	377.27	391.67
West South Central	80	356.82	335.31	413.04	366.87
Mountain	38	422.71	395.73	474.74	b
Pacific	109	527.94	496.66	601.91	521.67
				Standard Error of the Mean	
Total		6.100	8.375	8.297	14.970
New England		26.137	b	28.905	49.357
Mid Atlantic		25.316	b	29.052	34.256
East North Central		11.124	17.201	11.888	b
West North Cental		9.883	14.154	10.790	75.111
South Atlantic		13.450	20.487	14.683	b
East South Central		16.627	24.066	16.957	106.393
West South Central		11.784	15.105	17.605	35.405
Mountain		17.770	22.431	24.374	b
Pacific		17.410	20.655	21.860	53.541

[a] Total includes Internal Medicine, Pediatrics, Radiology, Anesthesiology, Psychiatry, and "Other" categories. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 32—Average Fee for Annual Examination by Census Division and Specialty, 1980[a]

	Total		Specialty				
Census Division	N	Mean	Gen. Prac. (N=832)	Int. Med. (N=747)	Surg. (N=492)	Ped. (N=103)	Ob./Gyn. (N=335)
			Mean				
Total[b]	2,619	$37.63	$35.79	$50.77	$30.58	$21.28	$28.00
New England	161	34.67	29.42	44.18	30.09	19.80	27.78
Mid Atlantic	451	34.88	30.36	47.77	29.06	24.42	26.21
East North Central	460	34.44	32.93	47.33	25.98	17.69	25.90
West North Central	189	33.41	29.35	51.29	29.62	17.63	24.67
South Atlantic	416	37.93	38.67	51.42	29.68	21.25	27.18
East South Central	130	30.95	28.95	42.58	32.18	17.43	23.82
West South Central	235	32.51	28.83	46.32	27.58	18.29	26.94
Mountain	120	39.70	39.85	52.30	32.69	c	23.50
Pacific	457	50.08	51.81	61.94	38.60	25.86	36.34
			Standard Error of the Mean				
Total		.457	.811	.929	.712	1.023	.657
New England		1.609	2.954	3.390	2.206	1.323	1.797
Mid Atlantic		1.070	2.165	2.145	1.400	3.795	1.117
East North Central		.925	1.632	1.854	1.164	1.082	1.266
West North Cental		1.556	1.375	4.473	3.601	1.711	2.930
South Atlantic		1.217	2.536	2.467	1.734	1.386	1.019
East South Central		1.682	2.336	4.108	4.358	1.429	2.024
West South Central		1.283	1.552	3.980	1.870	1.426	1.699
Mountain		1.948	3.252	3.828	3.153	c	2.298
Pacific		1.251	2.261	1.989	1.762	2.196	2.572

[a] An annual examination is defined as a "periodic or annual type examination, established patient, adult, excluding lab and x-ray." [b] Total includes Radiology, Anesthesiology, Psychiatry, and "Other" categories. [c] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 33—Average Professional Expenses by Specialty, 1970-1979[a]

Specialty	Year									
	1970	1971	1972	1973	1974	1975	1976[c]	1977	1978	1979
Total[b]	$24,300	$28,900	$31,300	$32,200	$34,000	$38,500	$42,400	$45,500	$46,400	$52,900
General Practice	24,200	32,100	34,500	34,000	36,700	38,600	42,400	46,100	47,800	55,700
Internal Medicine	25,000	28,300	31,300	34,000	35,800	40,400	45,600	45,600	44,800	52,500
Surgery	27,100	32,900	35,800	38,000	39,300	49,100	54,800	60,400	63,400	69,300
Pediatrics	24,900	28,500	30,000	32,400	30,000	34,600	36,600	39,100	35,100	51,000
Ob./Gynecology	27,700	33,300	36,500	37,200	41,900	48,500	54,400	60,900	61,900	67,000
Psychiatry	13,300	13,000	14,100	14,300	14,000	18,700	19,800	19,300	24,200	23,100
Anesthesiology	11,200	12,700	13,900	14,000	19,300	20,000	22,200	25,900	25,300	26,300

[a] Because of differences in sampling procedure, figures may not be consistent with previously published data for some years. [b] Physicians whose specialties were classified as Radiology and "Other" are included in this total. [c] Projected by respondents.

Source: Periodic Survey of Physicians, 1971-1980. Center for Health Services Research and Development, American Medical Association.

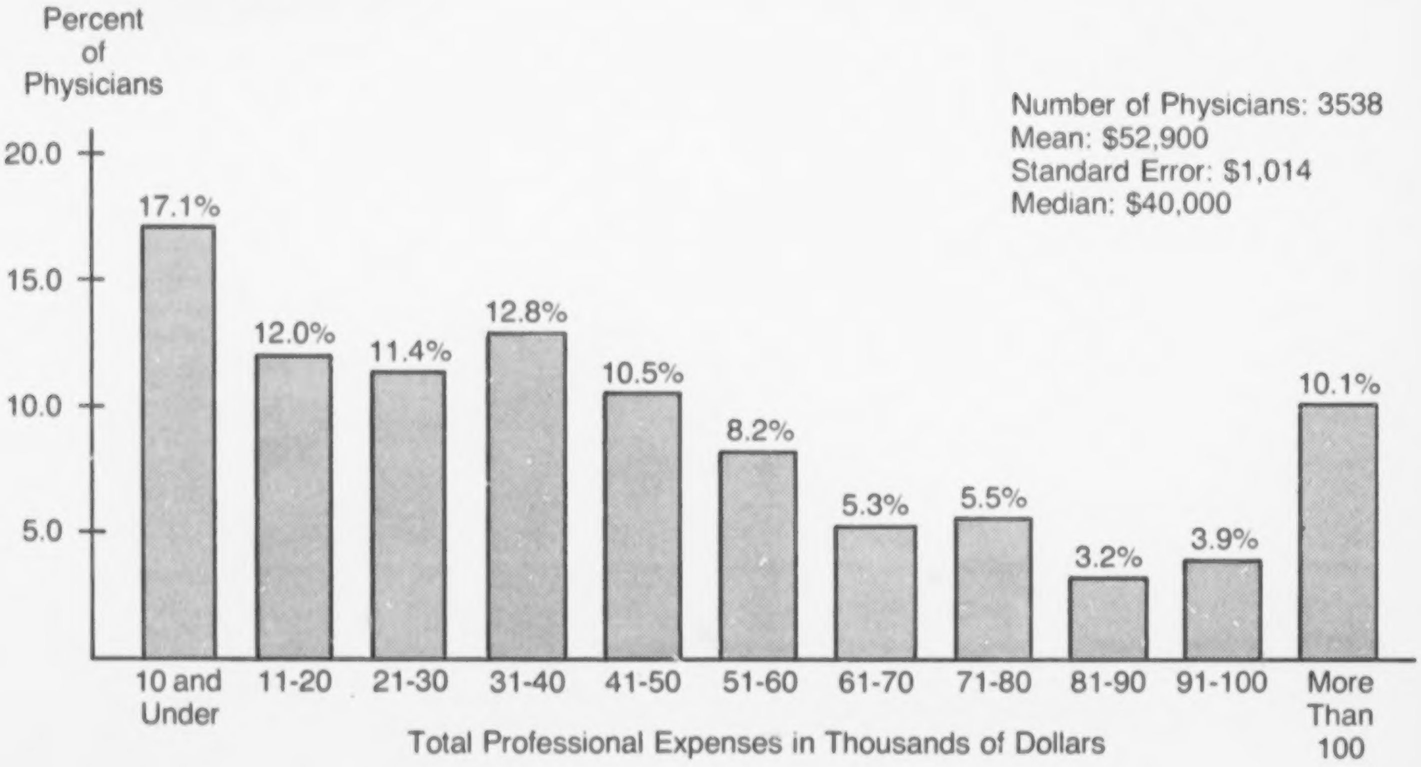
Table 34—Average Professional Expenses by Type of Practice and Specialty, 1979

	Total		Specialty							
Type of Practice	N	Mean	Gen.Prac. (N=702)	Int.Med. (N=621)	Surg. (N=837)	Ped. (N=213)	Ob./Gyn. (N=260)	Rad. (N=127)	Psych. (N=303)	Anes. (N=155)
		Mean								
Total[a]	3,538	$52,900	$55,700	$52,500	$69,300	$51,000	$67,000	$51,000	$23,100	$26,300
Solo	1,943	50,500	50,900	50,900	63,900	51,800	60,500	41,000	20,500	29,800
2-3 MDs	558	71,100	80,000	61,400	82,900	54,200	88,600	57,800	29,500	30,700
4-7 MDs	338	56,700	63,800	75,100	77,600	51,800	65,200	48,400	29,100	23,300
8 MDs & Over	288	44,800	46,800	48,100	77,500	39,200	71,900	31,400	15,500	16,300
		Standard Error of the Mean								
Total		1,014	2,085	2,166	2,256	3,372	4,467	8,217	2,352	2,560
Solo		1,053	2,141	2,102	2,368	3,169	4,266	10,091	1,055	3,400
2-3 MDs		3,666	8,484	8,323	7,000	6,495	16,758	16,587	6,510	15,189
4-7 MDs		3,350	5,752	10,496	8,839	7,963	6,523	15,829	10,584	4,187
8 MDs & Over		3,267	8,753	7,289	9,367	8,447	11,080	7,862	3,917	2,231

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

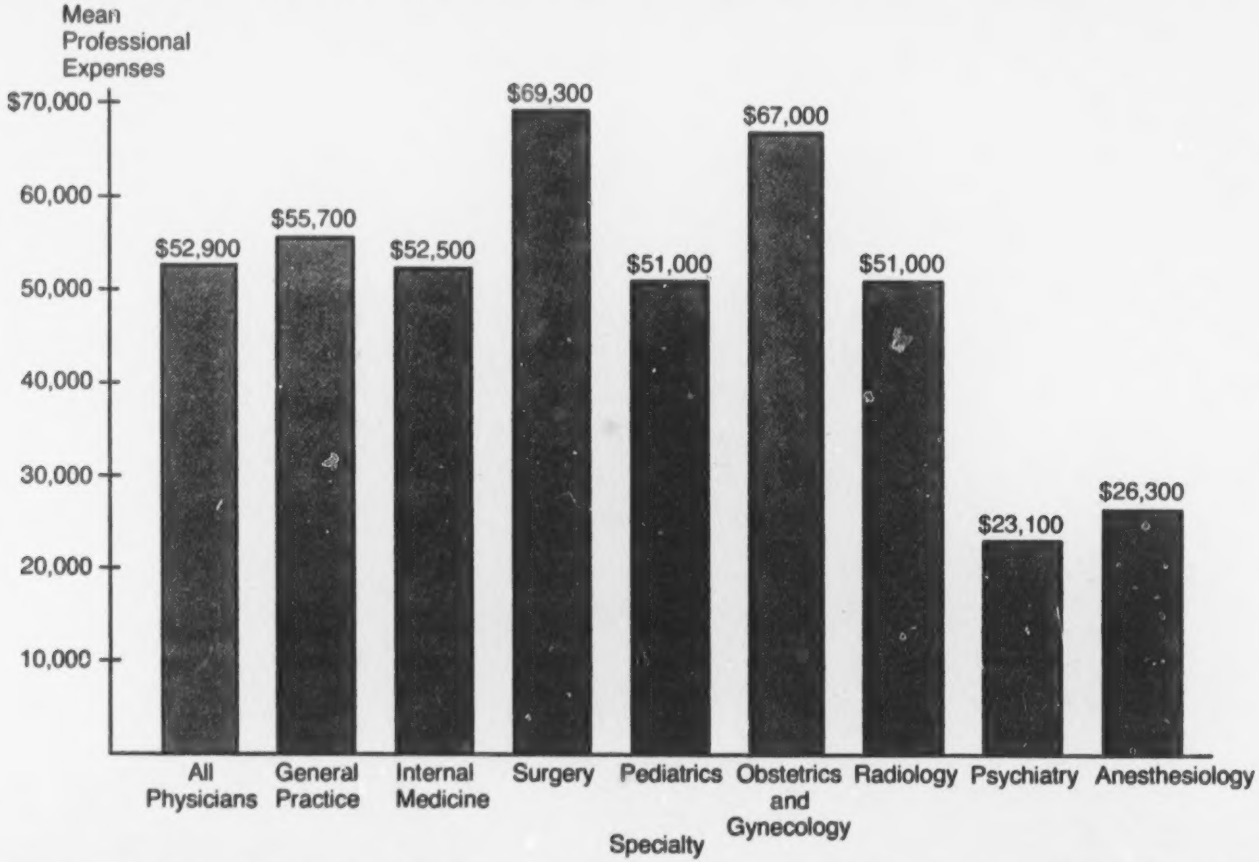
Figure 1—Percentage Distribution of Physicians by Professional Expenses, 1979



Number of Physicians: 3538
Mean: $52,900
Standard Error: $1,014
Median: $40,000

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Figure 2—Mean Professional Expenses by Specialty, 1979



Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Physicians' Net Incomes

For the average physician, net income from medical practice rose by an average annual rate of 7.2% from 1970 to 1979. The annual percentage increases in average net income from 1970 to 1979 were, by specialty:

Specialty	1970-1979
• Anesthesiology	9.8
• Obstetrics/Gynecology	7.7
• Surgery	7.4
• Internal Medicine	7.3
• General Practice	6.9
• Pediatrics	6.3
• Psychiatry	5.1

Net income from medical practice shows a consistent pattern by census division in 1979. Physicians in the East South Central census division had the highest mean net income for 1979 ($87,000). Further, physicians in the New England census division had the lowest mean net income for 1979 ($66,600). Other features of net income in 1979 include the following:

- The highest 1979 average net income occurred for physicians in metropolitan areas of one million or more persons ($78,800) followed by physicians in metropolitan areas of less than one million persons ($78,700) and physicians in nonmetropolitan areas ($76,400).
- Physicans age 41 through 45 earned the highest average net income in 1979 ($91,300) while physicians age 61 and over earned the least net income in 1979 ($63,200).

Slightly over one-half of physicians reported that their medical practice was a corporation in 1980. This percentage varied from a high of 72% for anesthesiologists to a low of 33% for psychiatrists. Further, the average 1979 net income for incorporated physicians ($92,000) exceeded that for physicians who are not incorporated ($64,500).

Table 35—Average Professional Expenses by Census Division and Specialty, 1979

	Total		Specialty							
Census Division	N	Mean	Gen.Prac. (N=702)	Int.Med. (N=621)	Surg. (N=837)	Ped. (N=213)	Ob./Gyn. (N=260)	Rad. (N=127)	Psych. (N=303)	Anes. (N=155)
			Mean							
Total[a]	3,538	$52,900	$55,700	$52,500	$69,300	$51,000	$67,000	$51,000	$23,100	$26,300
New England	212	38,000	33,300	38,400	57,500	45,600	26,400	b	12,900	b
Mid Atlantic	637	41,800	34,200	38,600	58,400	37,300	64,700	106,900	23,400	18,700
E. N. Central	590	52,100	57,900	48,100	58,900	51,700	81,400	49,200	40,200	23,200
W. N. Central	227	52,000	62,600	50,700	61,300	48,900	61,200	b	28,500	18,300
South Atlantic	573	54,900	55,500	59,300	70,400	47,300	63,700	32,800	16,100	32,900
E. S. Central	169	66,000	57,900	74,600	92,200	86,500	44,100	31,500	15,800	b
W. S. Central	293	61,200	71,800	71,600	66,400	63,400	59,600	51,200	21,700	29,100
Mountain	173	54,500	62,700	59,200	67,500	35,000	73,000	b	15,900	15,700
Pacific	664	60,200	64,800	58,100	89,400	64,200	79,300	46,600	21,300	33,200
		Standard Error of the Mean								
Total		1,014	2,085	2,166	2,256	3,372	4,467	8,217	2,352	2,560
New England		2,596	6,727	4,062	7,192	10,247	5,559	b	1,885	b
Mid Atlantic		2,084	3,016	2,837	3,965	5,259	7,664	43,557	6,751	2,523
E. N. Central		2,431	4,270	3,548	3,300	7,809	17,707	19,930	9,993	1,981
W. N. Central		2,892	5,249	8,617	5,575	8,057	8,687	b	5,385	5,195
South Atlantic		2,445	4,358	5,326	5,854	6,454	5,577	13,804	2,150	7,607
E. S. Central		6,127	12,315	13,400	12,582	34,672	10,330	13,030	5,108	b
W. S. Central		3,669	8,840	12,302	6,331	9,257	6,973	9,822	5,016	6,077
Mountain		3,673	12,695	8,330	6,094	9,197	8,181	b	5,680	6,209
Pacific		2,834	5,140	6,694	7,904	9,383	11,784	14,210	2,442	6,777

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 36—Average Professional Expenses by Specialty and Location, 1979

	Total		Location		
			Nonmetropolitan	Metropolitan	
Specialty	N	Mean	(N=522)	Less than 1,000,000[b] (N=1204)	1,000,000 and over[c] (N=1782)
				Mean	
Total[a]	3,538	$52,900	$58,700	$53,200	$50,900
General Practice	702	55,700	62,500	54,900	50,300
Internal Medicine	621	52,500	49,000	55,400	51,400
Surgery	837	69,300	74,400	69,100	67,900
Pediatrics	213	51,000	53,300	53,900	48,500
Obstetrics/Gynecology	260	67,000	61,200	63,800	70,500
Radiology	127	51,000	40,800	40,400	64,200
Psychiatry	303	23,100	13,400	21,700	24,500
Anesthesiology	155	26,300	24,100	28,800	25,000
				Standard Error of the Mean	
Total		1,014	2,638	1,677	1,448
General Practice		2,085	3,900	3,883	3,052
Internal Medicine		2,166	3,868	4,430	2,669
Surgery		2,256	6,458	3,332	3,365
Pediatrics		3,372	8,221	6,796	4,043
Obstetrics/Gynecology		4,467	9,601	5,851	7,201
Radiology		8,217	11,169	9,403	16,121
Psychiatry		2,352	3,404	2,947	3,294
Anesthesiology		2,560	8,054	5,663	2,584

[a] Total includes "Other" category. [b] All counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] All counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 37—Average Professional Expenses by Specialty and Corporation Status, 1979

Specialty	Total		Status	
			Not Incorporated	Incorporated
	N	Mean	(N=1754)	(N=1770)
			Mean	
Total[a]	3,538	$52,900	$39,300	$66,500
General Practice	702	55,700	44,200	80,100
Internal Medicine	621	52,500	38,400	68,200
Surgery	837	69,300	46,800	82,300
Pediatrics	213	51,000	44,700	61,100
Obstetrics/Gynecology	260	67,000	52,800	74,000
Radiology	127	51,000	74,000	43,000
Psychiatry	303	23,100	21,100	27,000
Anesthesiology	155	26,300	16,100	30,300
		Standard Error of the Mean		
Total		1,075	1,003	1,705
General Practice		2,093	1,755	4,982
Internal Medicine		2,173	1,578	4,002
Surgery		2,260	2,077	3,230
Pediatrics		3,380	3,258	6,826
Obstetrics/Gynecology		4,468	4,105	6,273
Radiology		8,275	24,387	6,802
Psychiatry		2,352	3,373	2,041
Anesthesiology		2,560	1,899	3,424

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 38—Average of Selected Components of Professional Expenses by Specialty, 1979

	Total Expense		Selected Expenses			
Specialty	N	Mean	Nonphysician Payroll (N=3578)	Professional Insurance (N=3578)	Medical Equipment (N=3578)	Office Expenses (N=3578)
			Mean			
Total[a]	3,538	$52,900	$19,368	$4,785	$4,700	$ 11,655
General Practice	702	55,700	22,109	2,745	4,193	12,077
Internal Medicine	621	52,500	19,429	2,726	4,309	12,205
Surgery	837	69,300	23,773	8,178	6,454	15,190
Pediatrics	213	51,000	22,419	2,240	4,368	12,914
Obstetrics/Gynecology	260	67,000	21,948	8,888	5,190	13,468
Radiology	127	51,000	21,026	4,005	12,527	8,838
Psychiatry	303	23,100	5,769	1,247	1,330	6,366
Anesthesiology	155	26,300	8,077	9,731	642	3,479
		Standard Error of the Mean				
Total		1,014	471	104	224	316
General Practice		2,085	1,059	111	255	725
Internal Medicine		2,166	1,041	155	302	643
Surgery		2,256	1,010	292	451	813
Pediatrics		3,372	2,009	170	1,077	1,220
Obstetrics/Gynecology		4,467	1,405	405	638	1,086
Radiology		8,217	3,731	481	4,208	2,198
Psychiatry		2,352	1,243	71	142	418
Anesthesiology		2,560	1,666	455	119	480

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Service Research and Development, American Medical Association.

Table 39—Average of Selected Components of Professional Expenses by Census Division, 1979

	Total Expense		Selected Expense			
Census Division	N	Mean	Nonphysician Payroll (N=3578)	Professional Insurance (N=3578)	Medical Equipment (N=3578)	Office Expenses (N=3578)
			Mean			
Total	3,538	$52,900	$19,368	$4,785	$4,700	$11,655
New England	212	38,000	13,384	2,986	3,240	8,814
Middle Atlantic	637	41,800	14,609	5,419	4,423	9,020
East North Central	590	52,100	18,974	4,404	3,706	10,303
West North Central	227	52,000	20,551	3,861	5,634	12,029
South Atlantic	573	54,900	20,333	4,185	4,962	13,653
East South Central	169	66,000	21,094	3,576	5,906	11,618
West South Central	293	61,200	25,622	3,619	5,377	12,159
Mountain	173	54,500	23,065	4,581	4,408	13,583
Pacific	664	60,200	20,989	6,866	5,255	13,973
		Standard Error of the Mean				
Total		1,014	471	104	224	316
New England		2,596	1,098	227	340	848
Middle Atlantic		2,084	965	275	792	529
East North Central		2,431	1,203	194	318	547
West North Central		2,892	1,770	255	998	1,704
South Atlantic		2,445	1,013	236	503	1,033
East South Central		6,127	1,989	328	1,267	1,436
West South Central		3,669	2,070	258	571	1,012
Mountain		3,673	3,041	429	710	1,368
Pacific		2,834	1,119	340	453	841

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services and Development, American Medical Association.

Table 40—Average Net Income from Medical Practice by Specialty, 1970-1979

Specialty	Year									
	1970	1971	1972	1973	1974	1975	1976[c]	1977	1978	1979
Total[b]	$41,800	$45,300	$47,200	$48,600	$52,000	$56,400	$59,500	$61,200	$65,500	$78,400
General Practice	33,900	39,800	41,300	41,900	44,700	45,400	47,400	51,200	54,600	62,000
Internal Medicine	40,300	42,900	44,700	47,800	51,400	57,000	60,500	61,500	63,800	76,200
Surgery	50,700	54,000	56,000	57,200	60,500	68,200	73,200	74,000	82,600	96,000
Pediatrics	34,800	38,500	38,900	41,200	42,100	44,300	47,000	48,200	51,200	60,400
Ob./Gynecology	47,100	51,100	53,200	55,400	61,700	63,300	65,800	69,900	70,300	91,800
Psychiatry	39,900	37,200	39,100	38,500	41,300	44,800	47,600	48,200	50,200	62,600
Anesthesiology	39,400	47,300	49,500	48,100	54,400	57,100	60,100	65,500	74,200	91,400

[a] Because of differences in sampling procedure, figures may not be consistent with previously published data for some years. [b] Physicians whose specialties were classified as Radiology and "Other" are included in this total. [c] Projected by respondents.

Source: Periodic Survey of Physicians, 1970-1980. Center for Health Services Research and Development, American Medical Association.

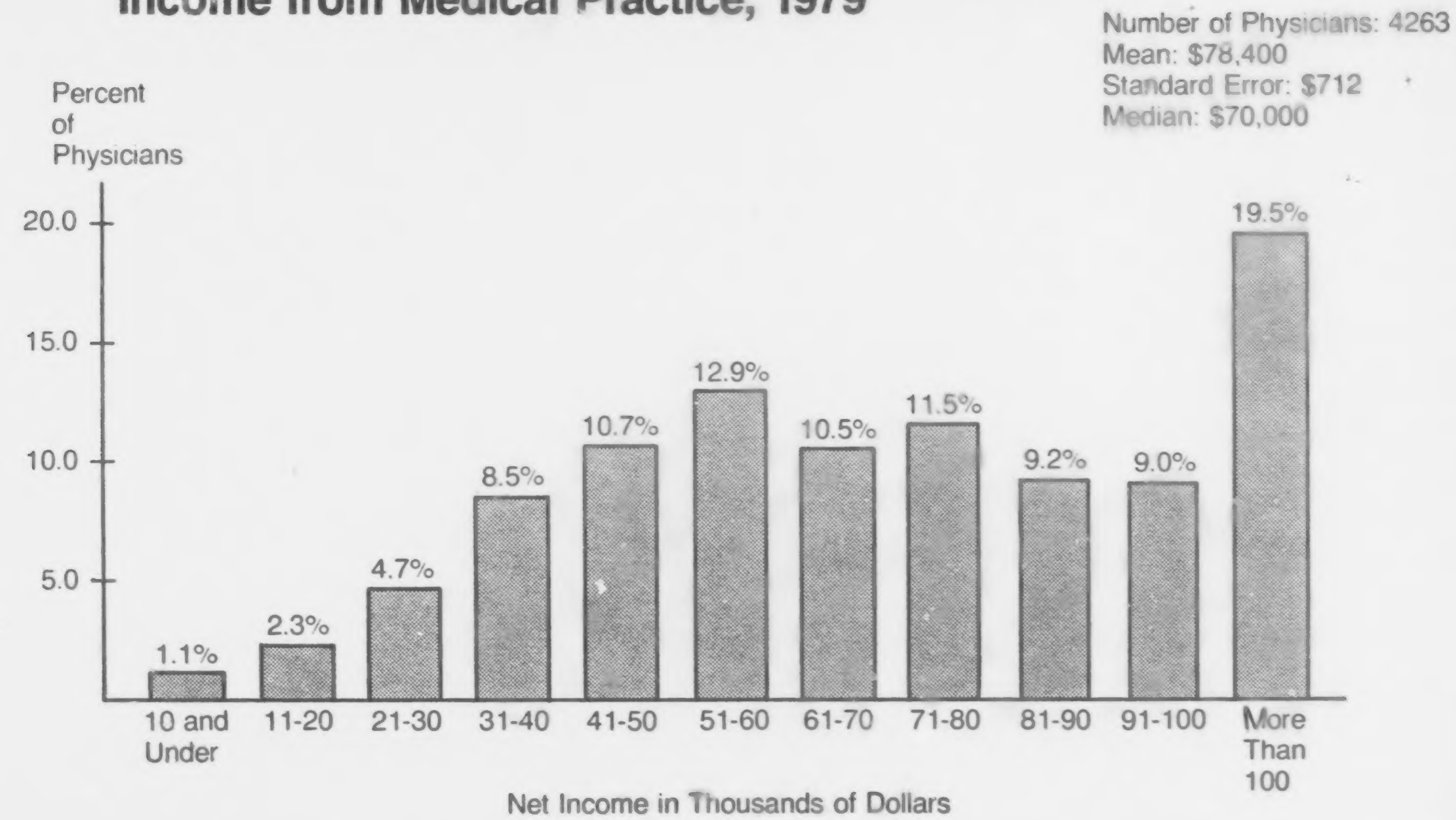
Table 41—Average Net Income from Medical Practice by Census Division and Specialty, 1979

Census Division	Total N	Total Mean	Gen.Prac. (N=818)	Int.Med. (N=763)	Surg. (N=949)	Ped. (N=278)	Ob./Gyn. (N=318)	Rad. (N=181)	Psych. (N=334)	Anes. (N=188)
			Mean							
Total[a]	4,263	$78,400	$62,000	$76,200	$96,000	$60,400	$91,800	$98,000	$62,600	$91,400
New England	253	66,600	46,300	64,200	78,100	57,900	75,700	78,700	57,100	b
Mid Atlantic	763	73,200	50,200	69,100	94,400	49,900	93,200	107,300	61,200	82,400
E. N. Central	699	81,200	62,200	82,000	95,900	66,400	97,800	103,800	71,100	96,500
W. N. Central	296	79,400	67,300	74,400	98,600	62,900	97,300	102,300	69,000	96,700
South Atlantic	661	79,800	66,900	81,500	96,400	57,400	87,100	100,400	57,000	90,300
E. S. Central	203	87,000	77,100	79,600	106,000	71,800	91,500	100,800	55,300	79,500
W. S. Central	362	85,800	71,800	86,600	99,500	71,300	89,600	104,900	98,800	118,700
Mountain	202	73,500	62,800	62,600	86,100	51,800	95,100	78,300	67,500	62,000
Pacific	824	78,600	56,600	78,300	101,200	64,100	94,700	81,600	54,600	103,700
			Standard Error of the Mean							
Total		712	1,301	1,574	1,671	1,538	2,866	5,393	2,014	2,616
New England		2,108	3,450	4,232	5,122	6,466	7,675	6,640	4,261	b
Mid Atlantic		1,834	2,299	2,832	3,956	2,414	6,565	27,171	2,940	4,695
E. N. Central		1,696	2,522	4,159	4,073	4,415	8,592	7,459	4,544	6,068
W. N. Central		2,115	3,202	5,999	5,316	8,465	13,426	7,124	5,533	7,525
South Atlantic		1,674	3,177	3,978	4,101	3,161	5,083	9,401	3,301	7,385
E. S. Central		4,013	14,194	5,756	7,261	7,297	18,625	10,856	13,348	5,817
W. S. Central		2,751	3,896	5,846	8,194	5,592	8,201	11,308	28,507	11,004
Mountain		2,469	5,559	6,544	4,398	6,774	8,463	7,240	8,255	3,620
Pacific		1,702	2,689	4,226	4,335	3,592	7,419	7,950	3,163	6,935

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

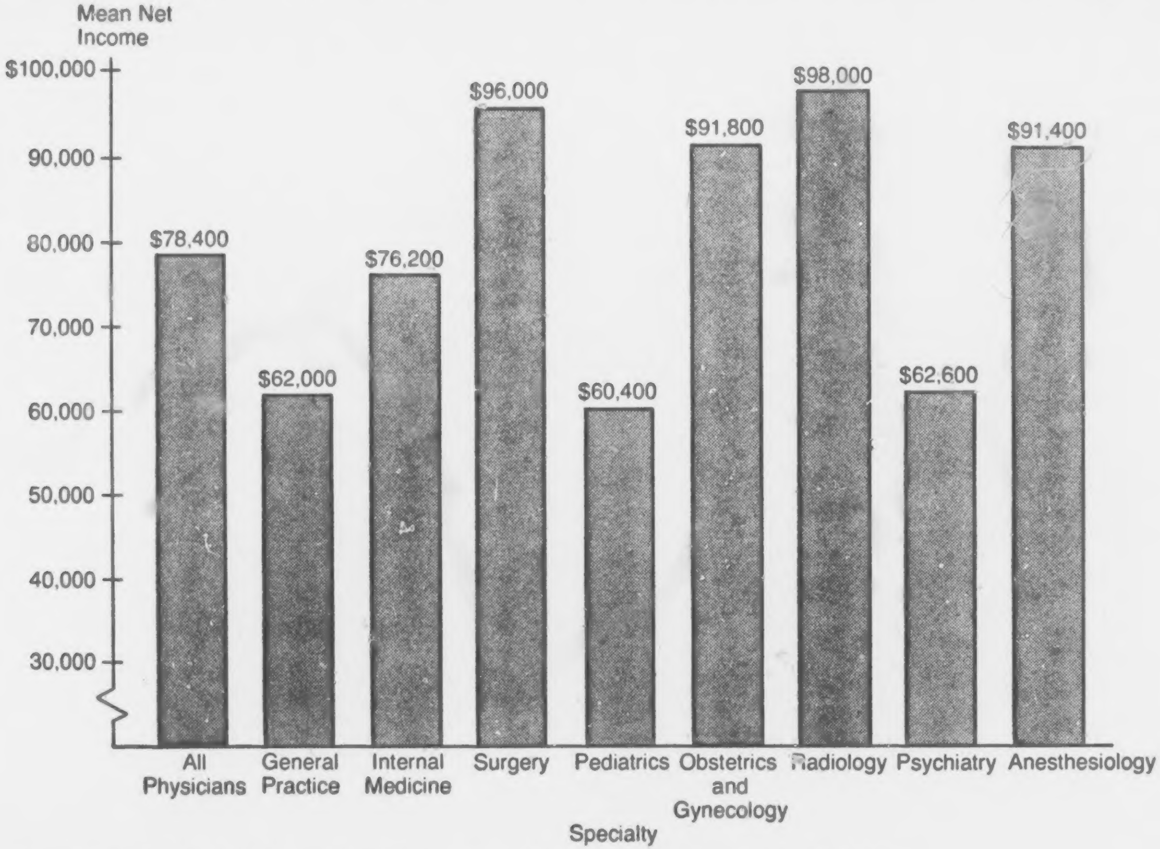
Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Figure 3—Percentage Distribution of Physicians by Net Income from Medical Practice, 1979



Source: Fourteenth Periodic Survey of Physicians March 1980. Center for Health Services Research and Development, American Medical Association.

Figure 4—Mean Net Income from Medical Practice by Specialty, 1979



Source: Fourteenth Periodic Survey of Physicians, March 1980. Center for Health Services Research and Development, American Medical Association.

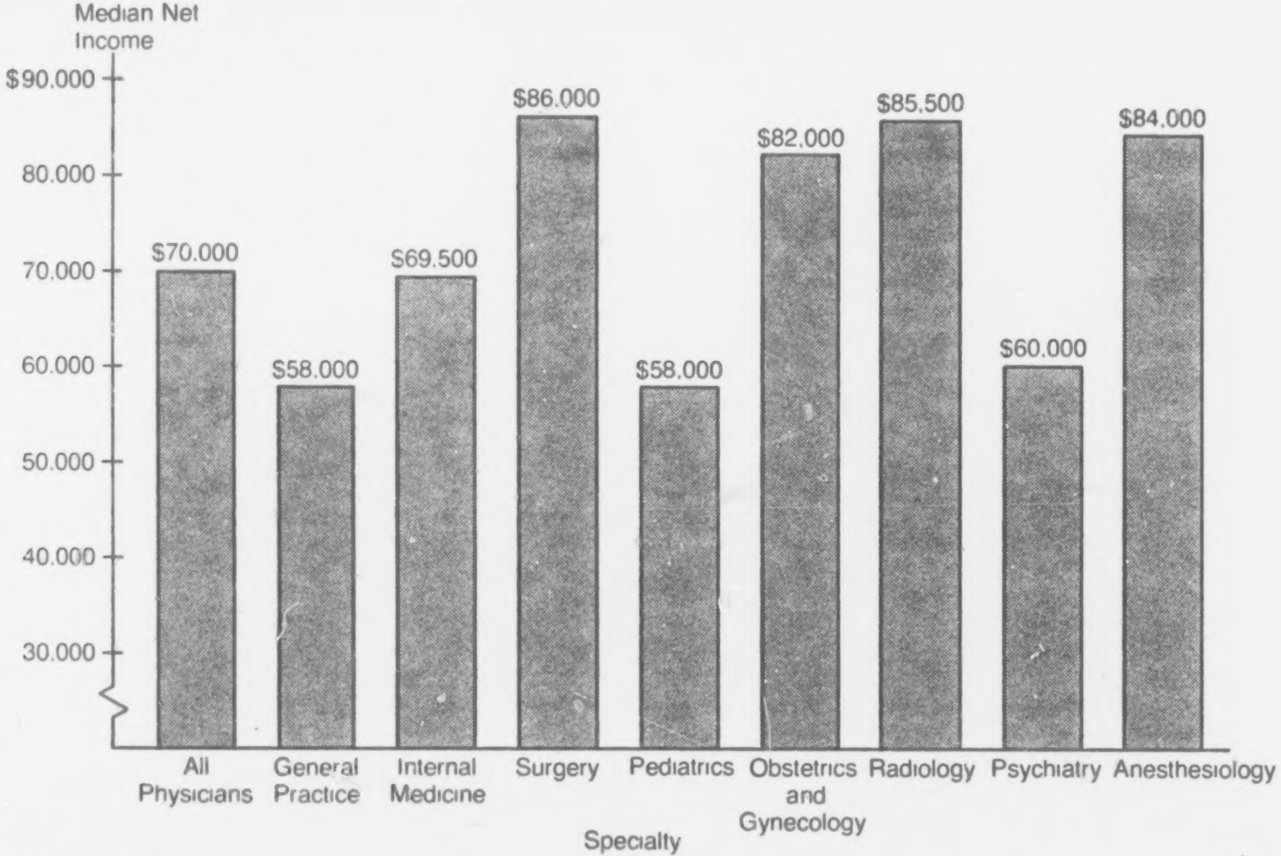
Table 42—Median Net Income from Medical Practice by Census Division and Specialty, 1979

	Total		Specialty							
Census Division	N	Median	Gen.Prac. (N=818)	Int.Med. (N=763)	Surg. (N=949)	Ped. (N=278)	Ob./Gyn. (N=318)	Rad. (N=181)	Psych. (N=334)	Anes. (N=188)
			Median							
Total[a]	4,263	$70,000	$58,000	$69,500	$86,000	$58,000	$82,000	$85,500	60,000	84,000
New England	253	60,000	40,500	54,000	70,000	62,500	65,000	80,000	55,000	b
Mid Atlantic	763	62,000	48,000	60,000	85,000	48,000	83,000	75,500	60,000	80,000
E. N. Central	699	75,000	60,000	75,000	84,000	60,000	80,000	95,500	69,000	95,000
W. N. Central	296	72,000	60,000	67,000	96,000	56,500	98,000	97,000	64,500	96,000
South Atlantic	661	73,000	60,000	74,000	87,000	54,500	80,000	86,500	57,500	80,000
E. S. Central	203	80,000	63,000	78,000	100,000	72,000	70,000	104,000	45,500	80,000
W. S. Central	362	75,000	66,000	78,000	85,000	65,000	85,000	87,000	69,000	110,500
Mountain	202	70,000	56,500	60,000	82,000	41,000	86,500	70,000	62,000	60,000
Pacific	824	70,000	52,000	70,000	90,000	60,000	84,000	72,000	50,000	100,000

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Figure 5—Median Net Income from Medical Practice by Specialty, 1979



Source Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development. American Medical Association.

Table 43—Average Net Income from Medical Practice by Specialty and Location, 1979

			Location		
			Nonmetropolitan	Metropolitan	
	Total			Less than 1,000,000[b]	1,000,000 and over[c]
Specialty	N	Mean	(N=662)	(N=1447)	(N=2154)
			Mean		
Total[a]	4,263	$78,400	$76,400	$78,700	$78,800
General Practice	818	62,000	69,200	59,600	57,700
Internal Medicine	763	76,200	75,800	75,800	76,500
Surgery	949	96,000	91,400	96,200	97,300
Pediatrics	278	60,400	59,200	69,900	60,200
Obstetrics/Gynecology	318	91,800	94,800	91,400	91,400
Radiology	181	98,000	94,100	100,000	97,700
Psychiatry	334	62,600	58,400	60,300	63,900
Anesthesiology	188	91,400	70,700	93,400	93,200
		Standard Error of the Mean			
Total		712	1,773	1,148	1,047
General Practice		1,301	2,902	1,827	1,884
Internal Medicine		1,574	4,241	3,078	1,988
Surgery		1,671	3,643	2,693	2,563
Pediatrics		1,538	4,217	2,742	2,053
Obstetrics/Gynecology		2,866	10,682	4,239	3,964
Radiology		5,393	8,256	4,917	10,099
Psychiatry		2,014	5,164	2,866	2,746
Anesthesiology		2,616	6,714	4,489	3,495

[a] Total includes "Other" category. [b] All counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] All counties in SMSAs with 1,000,000 or more inhabitants.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 44—Median Net Income from Medical Practice by Specialty and Location, 1979

Specialty	Total		Location		
			Nonmetropolitan	Metropolitan	
	N	Median	(N=662)	Less than 1,000,000[b] (N=1147)	1,000,000 and over[c] (N=2154)
			Median		
Total[a]	4,263	$70,000	$68,000	$72,000	$70,000
General Practice	818	58,000	60,000	54,000	55,000
Internal Medicine	763	69,500	65,500	68,500	70,000
Surgery	949	86,000	85,000	90,000	85,000
Pediatrics	278	58,000	54,000	55,000	60,000
Obstetrics/Gynecology	318	82,000	80,000	86,000	80,000
Radiology	181	85,500	90,000	96,000	80,000
Psychiatry	334	60,000	50,000	55,500	60,000
Anesthesiology	188	84,000	62,000	85,000	85,000

[a] Total includes "Other" category. [b] Includes all counties in SMSAs with 50,000 to 999,999 inhabitants and all counties considered potential SMSAs. [c] Includes all counties in SMSAs with 1,000,000 or more inhabitants

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 45—Average Net Income from Medical Practice by Specialty and Corporation Status, 1979

Specialty	Total		Status	
	N	Mean	Not Incorporated (N=2086)	Incorporated (N=2153)
			Mean	
Total[a]	4,263	$78,400	$64,500	$ 92,000
General Practice	818	62,000	57,000	71,900
Internal Medicine	763	76,200	63,400	90,000
Surgery	949	96,000	77,100	106,400
Pediatrics	278	60,400	57,500	65,100
Obstetrics/Gynecology	318	91,800	75,400	99,900
Radiology	181	98,000	92,000	101,200
Psychiatry	334	62,600	57,600	73,000
Anesthesiology	188	91,400	76,400	96,800
		Standard Error of the Mean		
Total		715	891	1,032
General Practice		1,308	1,660	2,158
Internal Medicine		1,584	1,663	2,565
Surgery		1,675	2,416	2,117
Pediatrics		1,544	1,970	2,430
Obstetrics/Gynecology		2,866	4,055	3,641
Radiology		5,393	14,085	3,500
Psychiatry		2,023	1,857	4,687
Anesthesiology		2,616	3,444	3,223

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 46—Median Net Income from Medical Practice by Specialty and Corporation Status, 1979

	Total		Status	
			Not Incorporated	Incorporated
Specialty	N	Median	(N=2086)	(N=2153)
			Median	
Total[a]	4,263	$70,000	$60,000	$82,000
Gen. Practice	818	58,000	50,000	65,000
Int. Medicine	763	69,500	60,000	80,000
Surgery	949	86,000	70,000	99,000
Pediatrics	278	58,000	55,000	62,000
Obstetrics/Gynecology	318	82,000	70,000	90,000
Radiology	181	85,500	70,000	97,000
Psychiatry	334	60,000	54,000	67,000
Anesthesiology	188	84,000	75,000	90,000

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 47—Percentage of Physicians Who Are Incorporated by Census Division and Specialty, 1980

	Total		Specialty							
			Gen. Prac. (N=978)	Int. Med. (N=918)	Surg. (N=1143)	Ped. (N=330)	Ob./Gyn. (N=381)	Rad. (N=216)	Psych. (N=378)	Anes. (N=214)
Census Division	N	Percent	Percent							
Total[a]	5,050	51%	35%	49%	65%	40%	67%	67%	33%	72%
New England	302	39	b	29	53	44	71	77	16	50
Mid Atlantic	920	42	20	39	60	37	72	50	27	57
E. N. Central	829	57	36	60	66	47	73	78	42	92
W. N. Central	340	54	45	65	68	19	73	65	52	73
South Atlantic	779	55	42	56	65	41	59	80	36	78
E. S. Central	251	53	29	67	62	58	58	75	b	50
W. S. Central	426	53	43	41	68	50	69	61	45	64
Mountain	232	53	38	51	67	42	47	63	b	64
Pacific	971	52	36	45	72	34	66	63	34	83

[a] Total includes "Other" category. [b] Data do not meet reliability standards.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 48—Average Net Income from Medical Practice by Type of Practice and Specialty, 1979

	Total		Specialty							
Type of Practice	N	Mean	Gen.Prac. (N=818)	Int.Med. (N=763)	Surg. (N=949)	Ped. (N=278)	Ob./Gyn. (N=318)	Rad. (N=181)	Psych. (N=334)	Anes. (N=188)
		Mean								
Total[a]	4,263	$78,400	$62,000	$76,200	$96,000	$60,400	$91,800	$98,000	$62,600	$91,400
Solo	2,053	75,800	62,400	74,400	90,600	59,200	88,600	99,800	65,500	96,400
2-3 MDs	654	86,100	65,200	85,300	104,400	62,000	93,400	91,800	78,200	76,900
4-7 MDs	450	91,200	64,900	87,500	114,500	67,900	94,300	121,300	55,600	91,500
8 MDs & Over	485	82,000	60,200	73,300	96,000	67,400	108,700	97,900	61,200	93,000
		Standard Error of the Mean								
Total		712	1,301	1,574	1,671	1,538	2,866	5,393	2,014	2,616
Solo		1,066	1,935	2,232	2,454	3,057	4,976	11,149	2,817	4,638
2-3 MDs		1,686	2,665	4,874	3,404	2,872	4,605	7,950	5,253	7,640
4-7 MDs		2,638	2,819	4,283	5,758	3,916	5,050	19,348	7,297	4,482
8 MDs & Over		1,635	3,483	2,585	4,304	3,291	11,080	5,583	5,464	5,049

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Table 49—Average Net Income From Medical Practice by Age of Physician and Specialty, 1979

Age of Physician	Total N	Total Mean	Specialty Gen. Prac. (N=818)	Int. Med. (N=763)	Surg. (N=949)	Ped. (N=278)	Ob./Gyn. (N=318)	Rad. (N=181)	Psych. (N=334)	Anes. (N=188)
			Mean							
Total[a]	4,263	$78,400	$62,000	$76,200	$96,000	$60,400	$91,800	$98,000	$62,600	$91,400
Less than 35	596	64,300	56,200	60,100	77,800	45,100	88,600	75,200	51,500	86,000
36-40	604	83,900	69,500	86,300	99,700	58,700	103,800	92,600	64,900	87,500
41-45	588	91,300	77,200	84,100	112,400	71,100	94,800	102,800	69,400	94,100
46-50	581	87,700	70,500	84,400	102,600	69,000	109,900	109,900	68,300	96,000
51-60	1,062	82,800	64,700	81,600	101,900	65,900	94,700	115,400	65,000	93,800
61 and Over	832	63,200	53,500	64,500	74,200	49,600	65,900	77,700	53,600	84,900
		Standard Error of the Mean								
Total		712	1,301	1,574	1,671	1,538	2,866	5,393	2,014	2,616
Less than 35		1,594	2,743	3,293	4,961	3,313	9,091	6,177	4,263	9,099
36-40		1,919	4,521	5,218	3,140	3,102	9,525	6,700	8,735	7,912
41-45		1,942	4,367	4,504	4,425	3,889	6,695	7,975	4,017	6,972
46-50		1,787	2,980	4,293	4,499	3,008	7,258	7,863	3,601	5,673
51-60		1,541	2,118	3,036	3,639	3,243	5,174	20,697	3,002	4,393
61 and Over		1,437	2,912	2,835	3,388	4,329	5,117	7,482	4,068	6,558

[a] Total includes "Other" category.

Source: Fourteenth Periodic Survey of Physicians. March 1980. Center for Health Services Research and Development, American Medical Association.

Appendix

1980 Periodic Survey of Physicians Questionnaire

PERIODIC SURVEY OF PHYSICIANS

CENTER FOR HEALTH SERVICES RESEARCH AND DEVELOPMENT

American Medical Association
535 North Dearborn Street
Chicago, Illinois 60610

© American Medical Association 1980

Dear Doctor:

In its efforts to obtain reliable information on the practice of medicine, the American Medical Association instituted the Periodic Survey of Physicians in 1966. Results from each survey have been published annually in the Profile of Medical Practice. The cooperation exhibited by the responding physicians demonstrates that the profession is willing to participate in the development of valid, reliable data on medical practice.

Your assistance is now being sought so that the series may be broadened to include both new information and larger segments of the profession. The results will enable the calculation of national, regional, and specialty averages with stated reliability. These surveys have been very useful in representing the physician's practice situation. All responses will be handled in the strictest confidence and only aggregate figures will be published.

The success of this survey and, therefore, its usefulness to the individual physician and to the profession depends on your reply. Your cooperation in this important project is greatly appreciated.

Sincerely,

James H. Sammons, M.D.
Executive Vice President

INSTRUCTIONS

Please answer ALL of the following questions. For questions which are NOT APPLICABLE to your practice, please mark N.A. For questions where the appropriate response is ZERO, please mark a ZERO rather than leaving the response blank or using a dash. If you do not have specific information, please provide an estimate. Please return your completed questionnaire in the enclosed envelope.

A. PRACTICE CHARACTERISTICS

1. Please give the SPECIALTY from which you derived 50% or more of your 1979 MEDICAL income.. ____________ 12-14

2. How many weeks did you practice in 1979? (EXCLUDE residency, medical meetings, military service, vacations and similar absences from practice.).......................... ________ WEEKS 15-16

3. Is your practice organized as a professional corporation? ☐ Yes 17-1 ☐ No 17-2

4. Which of the following best describes the size and type of your main practice arrangement?

   ☐ Solo (Individual, self-employed) 18-1

   ☐ Partnership or Group Practice. Please indicate the number of physicians INCLUDING yourself.. ________ 18-2 19-22

   ☐ Other ____ 18-3
   (Please describe)

5. If you are in a partnership or group practice arrangement, which of the following BEST describes your method of income distribution? ☐ Equal distribution ☐ Straight salary 23-2

   ☐ Salary plus share of profit 23-3 ☐ Fee-for-service (expense sharing) 23-4

   ☐ Other ____ 23-5
   (Please describe)

B. HOURS PRACTICED AND PATIENT VISITS

1. How many TOTAL HOURS did you practice during your most recent COMPLETE WEEK of practice? (EXCLUDE "on-call" hours not actually worked.).......................... ________ HOURS 24-26

2. How many of these HOURS were spent in providing DIRECT PATIENT CARE or patient-related service? (INCLUDE interpreting X-rays, lab tests, etc. EXCLUDE administrative tasks, meetings, etc.).. ________ HOURS 27-29

3. How many HOURS did you spend in the following activities during your most recent COMPLETE WEEK of practice?

   a. Seeing patients in office.. ________ HOURS 30-32

   b. Seeing patients in hospital (inpatient, outpatient, etc.).............................. ________ HOURS 33-35

   c. In business administration activities (employee supervision, filling out insurance forms, etc.).. ________ HOURS 36-38

4. How many TOTAL PATIENT VISITS did you have during your most complete week of practice (Include all patient contacts other than telephone)........................ ________ VISITS 39-41

5. How many PATIENT VISITS did you have during your most recent COMPLETE WEEK of practice:

   a. At the office.. ________ VISITS 42-44

   b. At the hospital.. ________ VISITS 45-47

   c. At all other facilities.. ________ VISITS 48-50

6. Please give the approximate time that a patient wishing to see you has to wait:

   a. To be scheduled for a routine office visit.

      A New Patient: ________ DAYS An Established Patient: ________ DAYS 54-

   b. To see you after arriving for a scheduled appointment: ________ MINUTES

C. PRACTICE SETTINGS

1. How *important* was each of these issues to your *choice* of solo or group practice?

(Please check one box in each row)

	Very Important	Important	Not Important
a. Business side of medical practice	☐ 60-1	☐ 60-2	☐ 60-3
b. Predictability of practice schedule	☐ 61-1	☐ 61-2	☐ 61-3
c. Personal autonomy in delivering care	☐ 62-1	☐ 62-2	☐ 62-3
d. Practice location	☐ 63-1	☐ 63-2	☐ 63-3
e. Earnings potential	☐ 64-1	☐ 64-2	☐ 64-3

2. Do you individually or through a group practice have a formal agreement or contract with an organization that provides prepaid health services (e.g., HMO, IPA, etc.)? Yes ☐ 65-1 No ☐ 65-2

3. If yes, please indicate the name of this organization:

____

Name of Organization 66-68 *City* *State* *Zip*

4. What percentage of your patients belong to this prepaid health organization: ________% 69-71

5. Please specify the name and location of the hospital to which you MOST FREQUENTLY admit patients. If you do not admit patients to a hospital, check this box ☐ 72-1 and proceed to question 7. 80 1

____

Name of Hospital 12-18 *City* *State* *Zip*

6. How many years have you had admitting privileges at this hospital? ________YEARS 19-20

7. Are you a member of your local PSRO? Yes ☐ 21-1 No ☐ 21-2

D. FEES AND REIMBURSEMENT

1. For each of the following procedures, please indicate your CURRENT USUAL FEE: (If you do not have a fee-for-service practice, please check this box ☐ 22-1 and disregard this question.)

a. Office visit, NEW patient, brief evaluation, history, examination and/or treatment.. $________.00 23-25 ☐ N.A. 26-1

b. Office visit, ESTABLISHED patient, brief examination and/or treatment, same or new illness.. $________.00 27-29 ☐ N.A. 30-1

c. Appendectomy .... $________.00 31-33 ☐ N.A. 34-1

d. Periodic or annual type examination, established patient adult, exclude lab, X-ray.. $________.00 35-37 ☐ N.A. 38-1

e. Hospital visit, new or established patient, brief examination, evaluation and/or treatment, same illness................................ $________.00 39-41 ☐ N.A. 42-1

2. Please estimate the percentage of your current patients whose principal HEALTH INSURANCE coverage for physician's services is:

a. Medicare.. ________% 43-45

b. Medicaid.. ________% 46-48

c. Prepayment-Capitation (HMO, IPA).. ________% 49-51

d. Other health insurance plans (Blue Cross/Blue Shield, commercial plans, etc.).............. ________% 52-54

e. No health insurance.. ________% 55-57

E. INCOMES AND EXPENSES

1. What were your total tax-deductible PROFESSIONAL EXPENSES in 1979. (If you shared expenses with other physicians, indicate your share only.)

a. 1979 Professional Expenses $________,000 58-61

b. PROJECTED 1980 Professional Expenses $________,000 62-65

2. What was your 1979 INDIVIDUAL NET INCOME BEFORE TAXES from medical practice? (INCLUDE all income from fees, salaries, retainers, etc., as well as the value of all fringe benefits paid on your behalf, e.g., Keogh Plan.)

a. 1979 Individual Net Income Before Taxes $________,000 66-69

b. PROJECTED 1980 Individual Net Income Before Taxes $________,000 70-73

80-2

3. Please list the single most expensive piece of medical equipment you purchased during the past five years:

________________________	________	________
Name of Equipment 12-13	*Cost* 14-19	*Year* 20-21

4. What were your total tax-deductible PROFESSIONAL EXPENSES for the following items in 1979? (If you shared expenses, indicate only your share.)

a. Total non-physician payroll expenses (INCLUDING fringe benefits)........................ $________.00 22-27

b. Professional liability (malpractice) insurance.. $________.00 28-33

c. Medical equipment expenses (annual depreciation, leases, rent)........................ $________.00 34-39

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ISBN 0-89970-097-7

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